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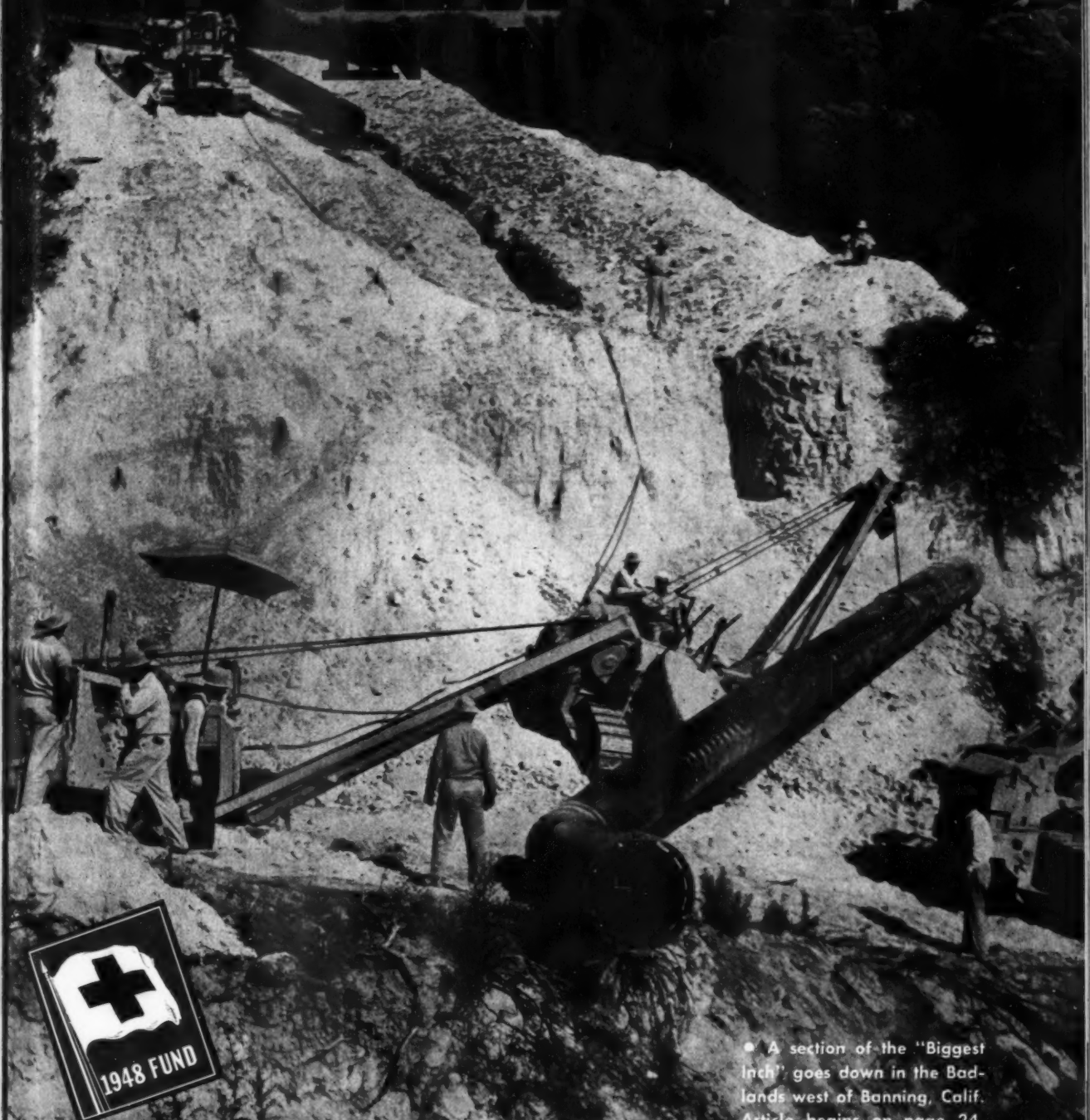

1948 FUND

● A section of the "Biggest Inch", goes down in the Badlands west of Banning, Calif. Article begins on page 24.

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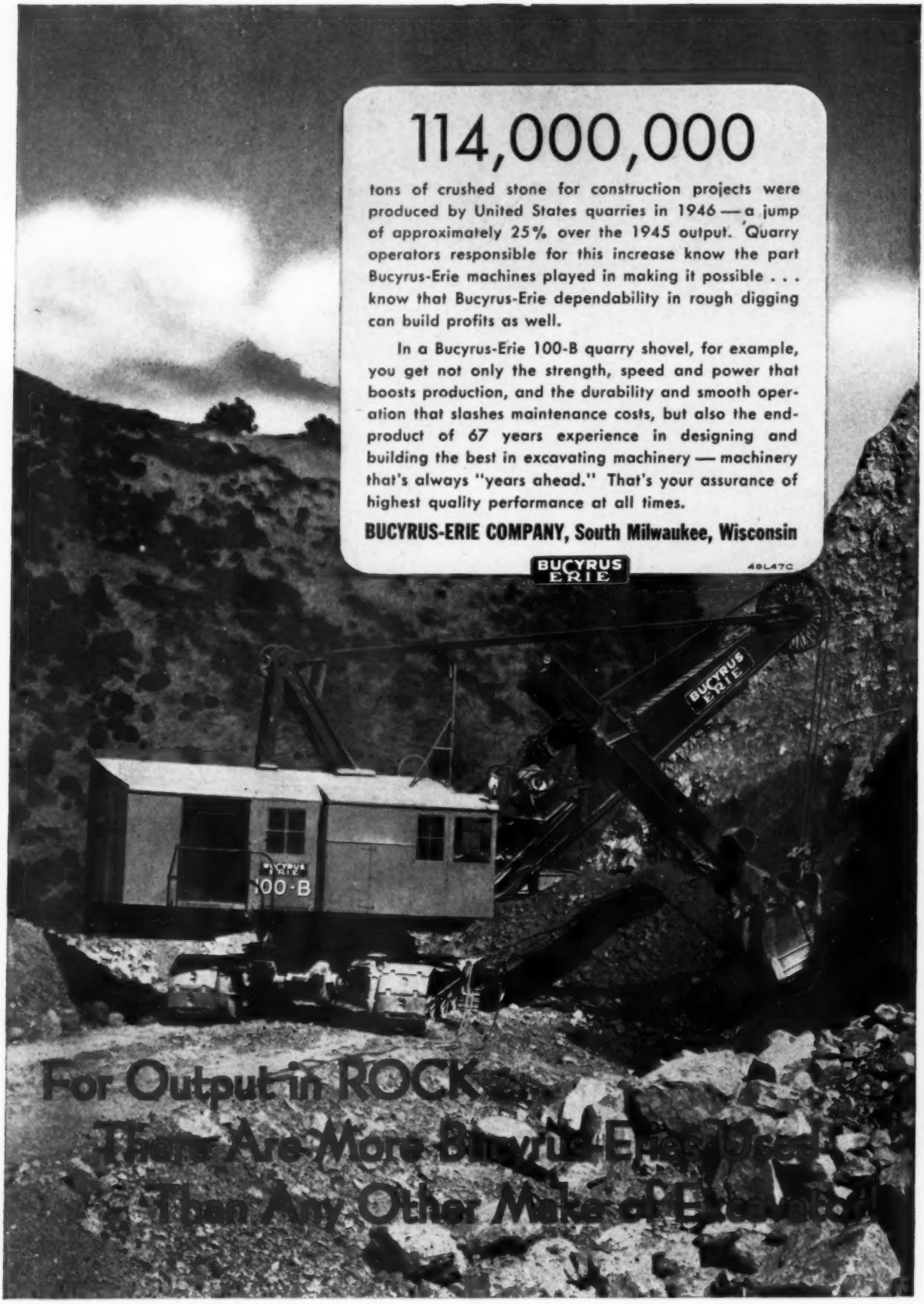
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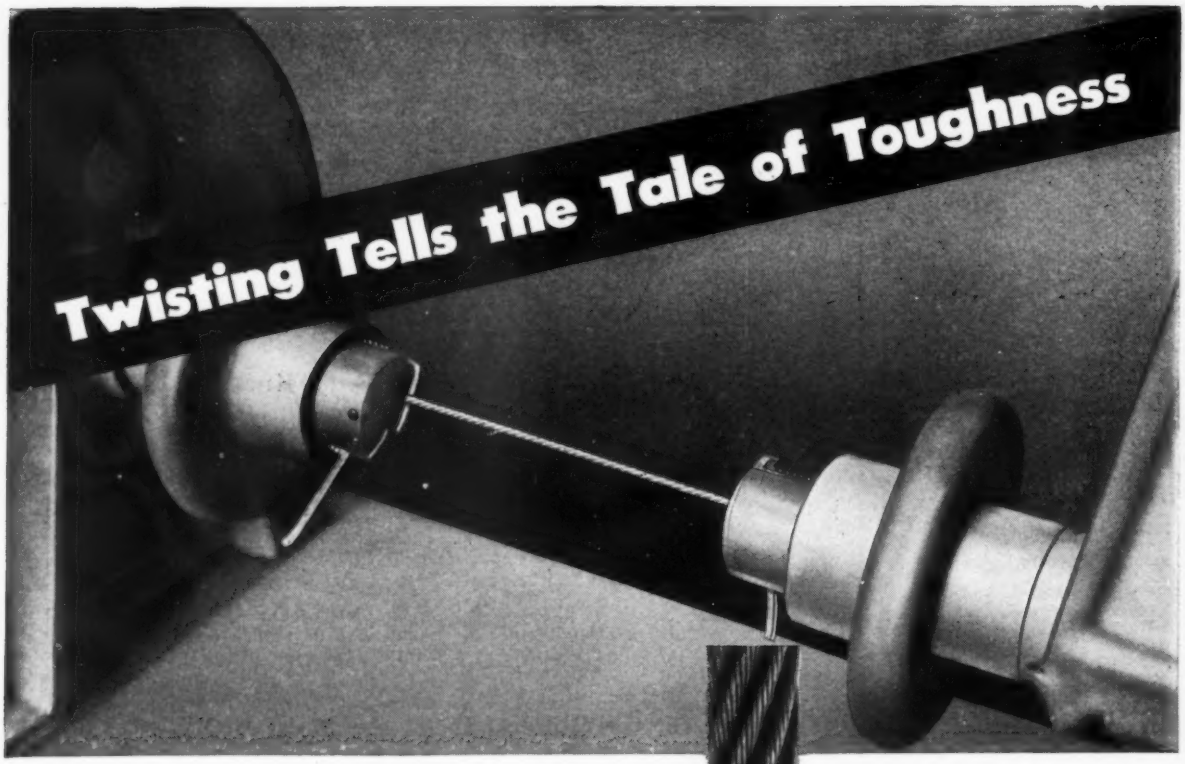

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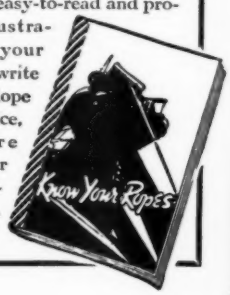

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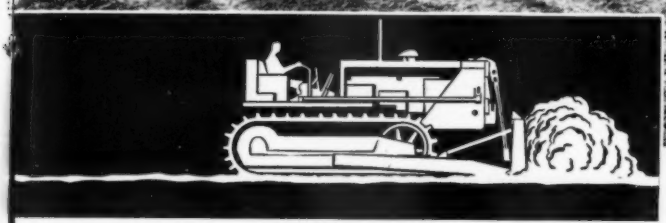
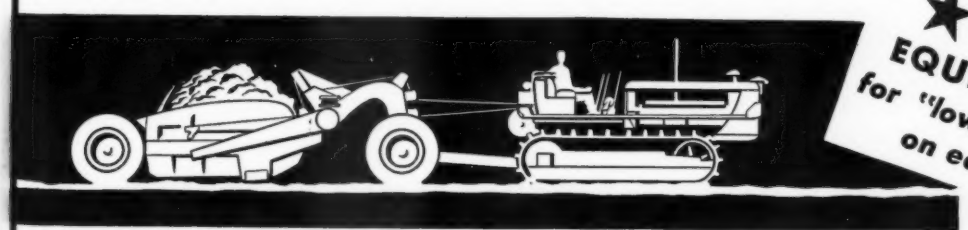
"Caterpillar" Diesel DW10 Tractors pull scrapers carrying earth to the fill on U. S. Highway 52, west of Portsmouth, O. *(The standard model DW10 Tractor is priced, without scraper, at $8830, F.O.B. Peoria, subject to change without notice.)*

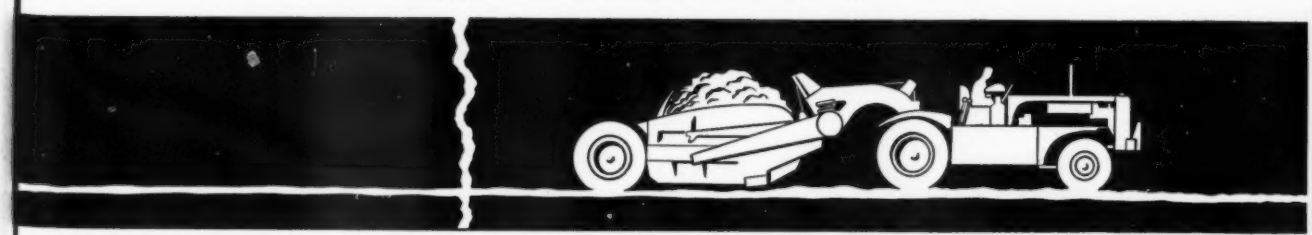


ZONE 1. "Caterpillar" Diesel Track-type Tractors Equipped With Bulldozers and Rippers



★ ZONED EQUIPMENT for "lowest costs on earth"

ZONE 2. "Caterpillar" Diesel Track-type Tractors for Loading and Pulling Scrapers



ZONE 3. "Caterpillar" Diesel Wheel-type Tractors for High Speed on Long Hauls

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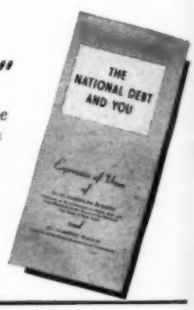
a 12-page pocket-size brochure, expresses the views of W. Randolph Burgess, Vice Chairman of the Board of the National City Bank of New York, and Clarence Francis, Chairman of the Board, General Foods Corporation. Request your copy from the Treasury Department's State Director, Savings Bonds Division.



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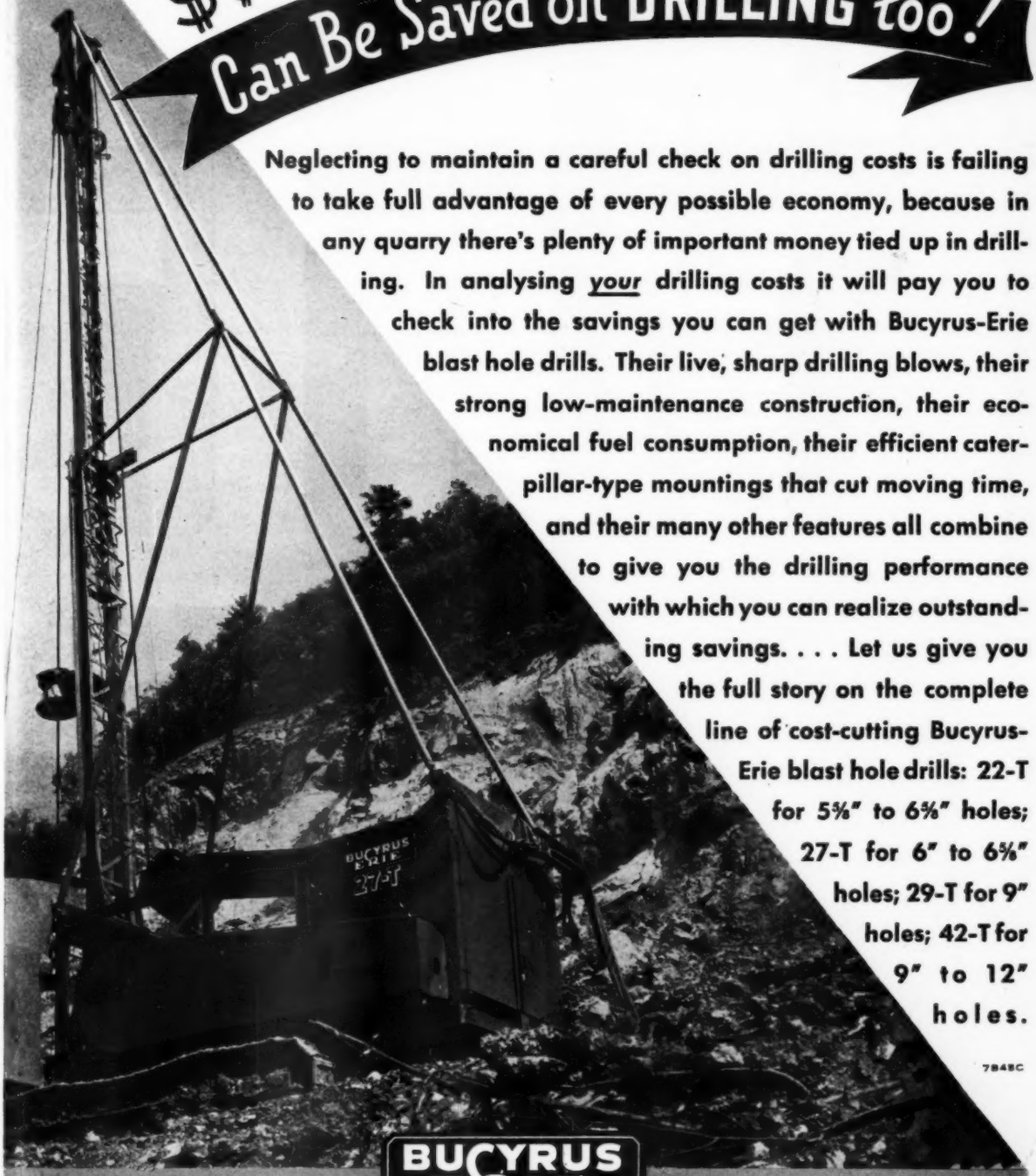

Neglecting to maintain a careful check on drilling costs is failing to take full advantage of every possible economy, because in any quarry there's plenty of important money tied up in drilling. In analysing *your* drilling costs it will pay you to check into the savings you can get with Bucyrus-Erie blast hole drills. Their live, sharp drilling blows, their strong low-maintenance construction, their economical fuel consumption, their efficient caterpillar-type mountings that cut moving time, and their many other features all combine to give you the drilling performance with which you can realize outstanding savings. . . . Let us give you the full story on the complete line of cost-cutting Bucyrus-Erie blast hole drills: 22-T for 5⅜" to 6⅝" holes; 27-T for 6" to 6⅝" holes; 29-T for 9" holes; 42-T for 9" to 12" holes.

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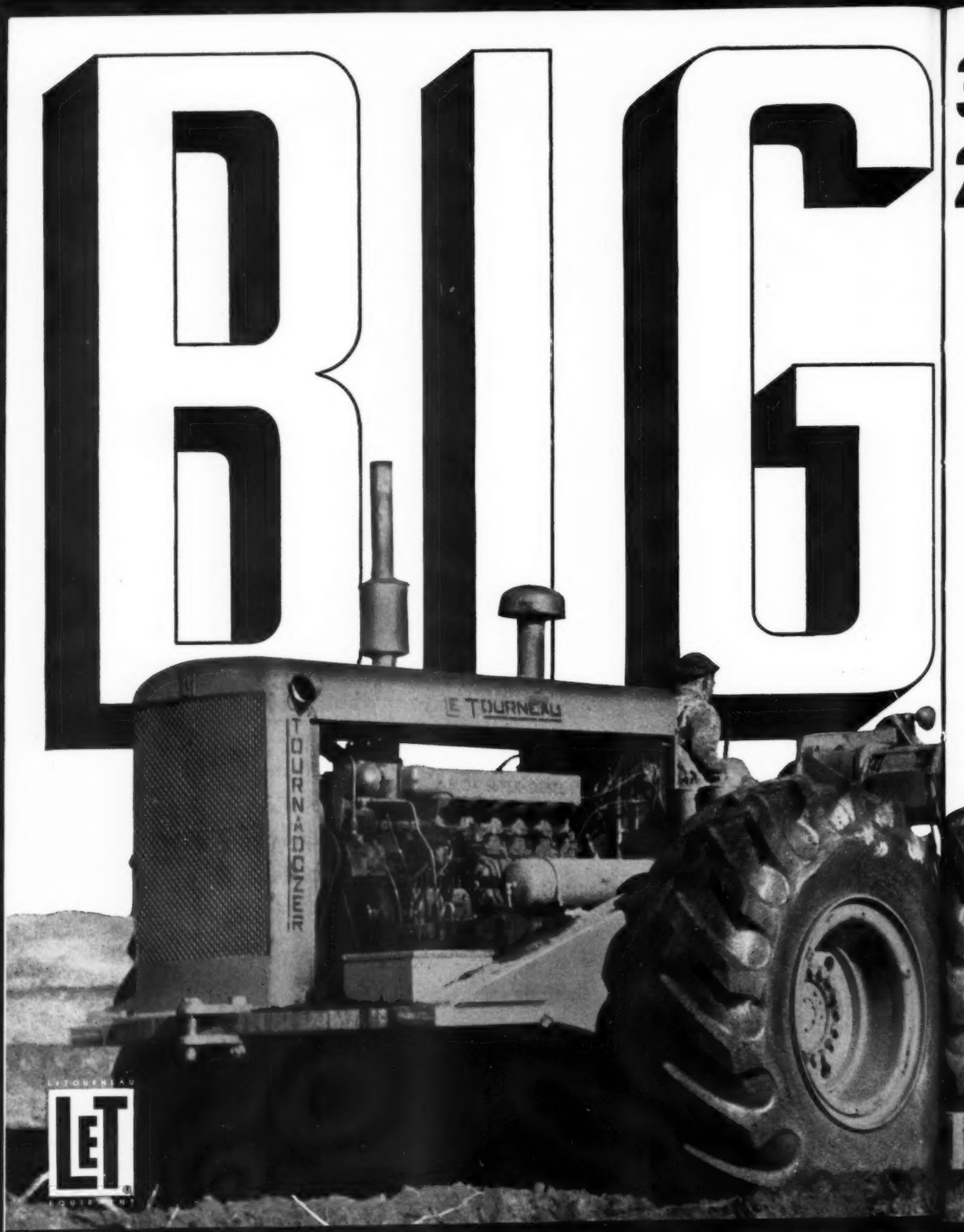

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WITH TODAY'S biggest team of dirtmovers, the B Tournadozer and B Tournapull, you have, for the first time, an ideal combination of BIG matched high-speed dirtmoving equipment. The new B pusher behind the B Tournapull gets big loads fast — up to 29 heaped yards in less than a minute. This dozer has speed and manuverability to synchronize its full 300 h.p. instantly with the 225 h.p. on the Tournapull . . . it's this matched equipment that gives you accurate pushing and cutting control. Both Tournapull and Tournadozer have instantaneous gear selection without shifting . . . both have instantaneous electric controls. Both units drive on big (24.00 x 29) tires built with the new tapered beads and rayon cords to take safely, the tremendous traction developed . . . tremendous loads carried. These new type tires permit low pressure flotation for work in sand and muck. They're interchangeable — from Tournadozer to Tournapull.

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3rd gear	Fwd. and Rev. 6.8	Forward 7.50
4th gear	Fwd. and Rev. 13.6	Forward 15.00
Tires	24.00 x 29	24.00 x 29
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Transmission	Constant Mesh–Tournamatic	Constant Mesh–Tournamatic
Drive	4-wheel	2-wheel
Working Weight	25 tons	22 tons empty
Load Capacity	Blade: 5½ cu. yds. top soil	Scraper: 26 yds. struck (35-ton load limit)

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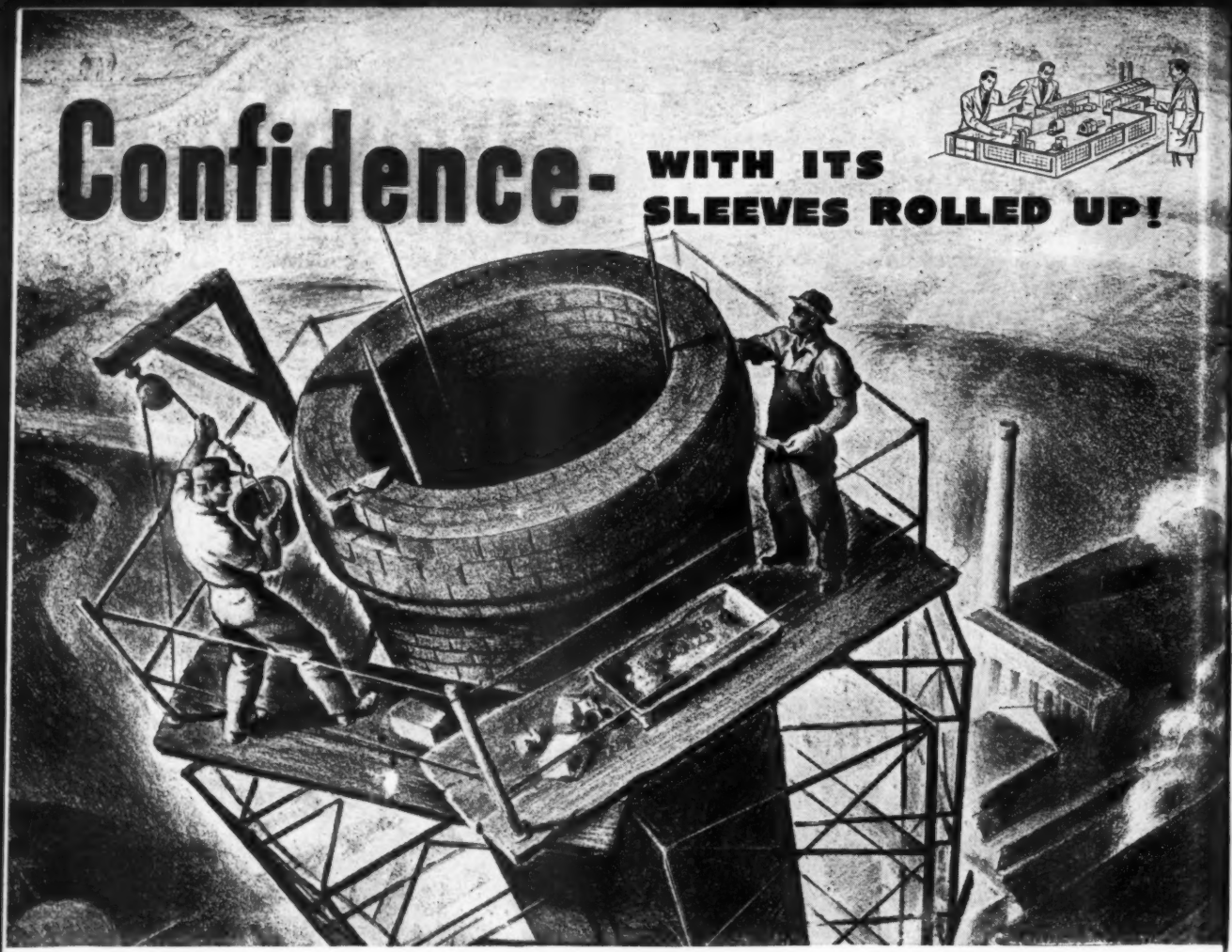

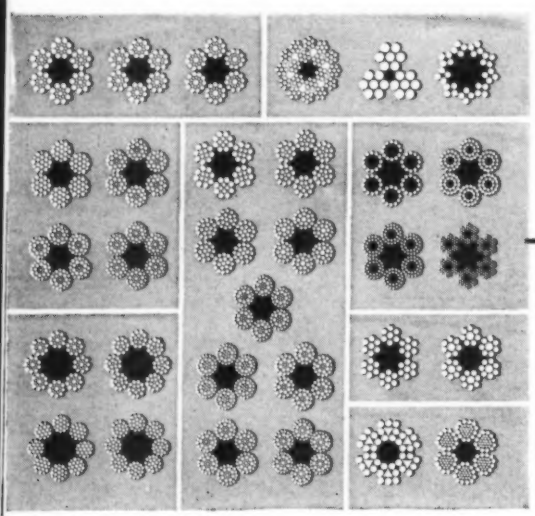

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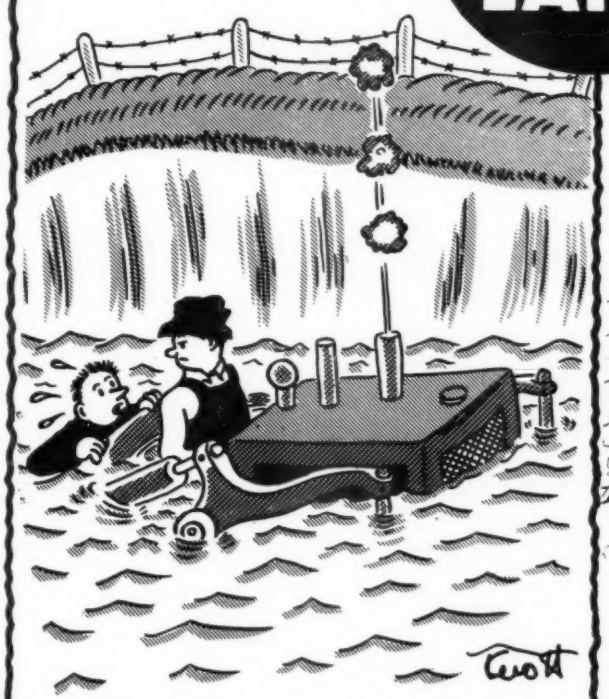
EX-LAFFS

"Oh, excuse me!"

"Drop in again, sometime!"



"Frankly, Jackson, I don't think kicking me feet is going to help much."

"Scenic be damned — put that mountain back where you found it!"

A major portion of the comprehensive plan for controlling flood waters in the Yazoo River Basin in Mississippi will become effective upon completion of the last two dams — Enid and Grenada — in the overall project for this basin.

THE Yazoo Basin Headwater Project includes the construction of four dams, channel improvements and levee construction, and when completed will afford substantial protection to the Yazoo River Basin above the area subject to overflow by backwater from the Mississippi River. Two dams, Sardis on the Little Tallahatchie River nine miles east of Batesville, Mississippi, and Arkabutla on the Coldwater River seven miles west of the town of Coldwater, Mississippi, were completed in 1939 and 1943, respectively.

Construction of the remaining two dams, Enid and Grenada, was initiated just a year ago. Enid Dam is being constructed on the Yocona River approximately 12 miles south of Batesville, Mississippi in Yalobusha County, and will control the runoff of 560 square miles of hill country. The Grenada Dam is located on the Yalobusha river two miles northeast of Grenada, Mississippi in Grenada County and will have a drainage area of 1,320 sq. miles.

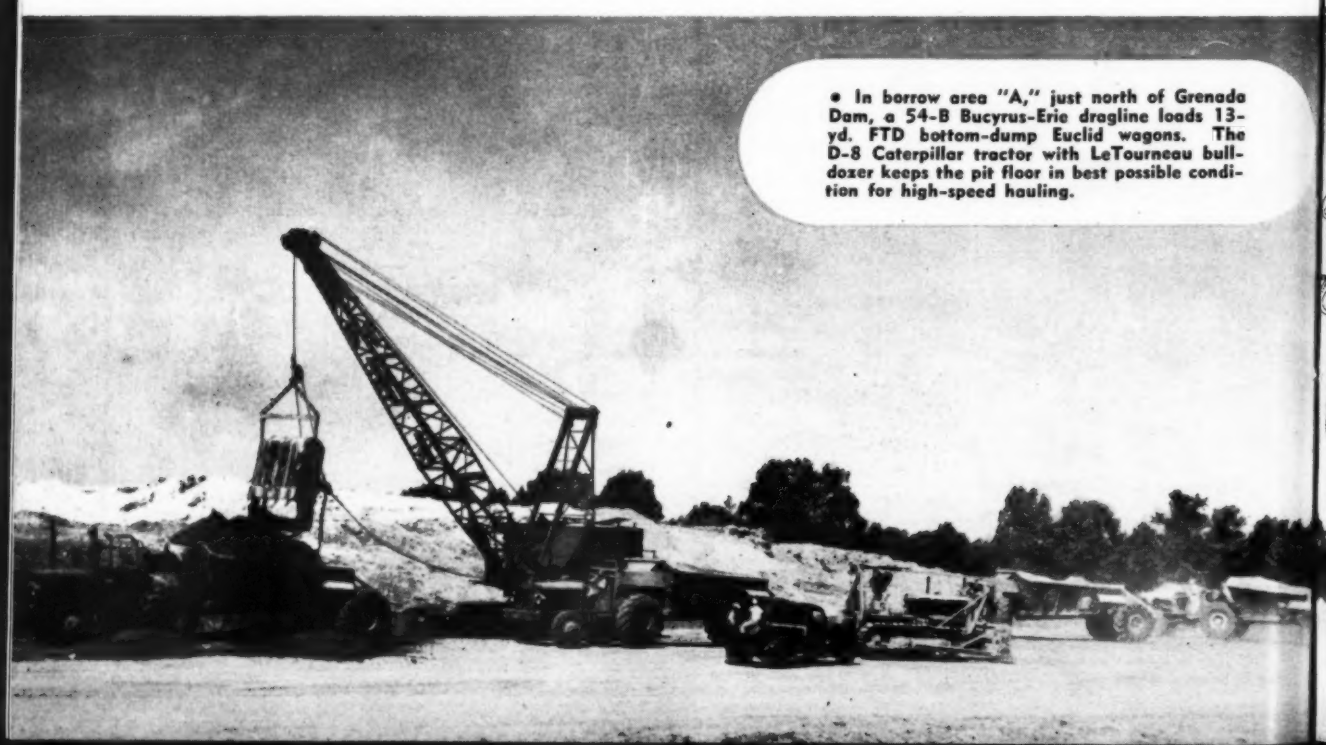
The dams were authorized by the Flood Control Act of June 15, 1936 (Public No. 578, 74th Congress, 53531) and subsequent amendments. Planning and construction of both Enid and Grenada dams are under the direction of Major General R. W. Crawford, president, Mississippi River Commission, Vicksburg, Miss., and under the immediate supervision of Colonel R. G. Lovett, district engineer, Vicksburg District, Corps of Engineers. J. R. Stephens and H. L. Mullin are resident engineers on the Grenada and Enid Projects, respectively.

Grenada Dam

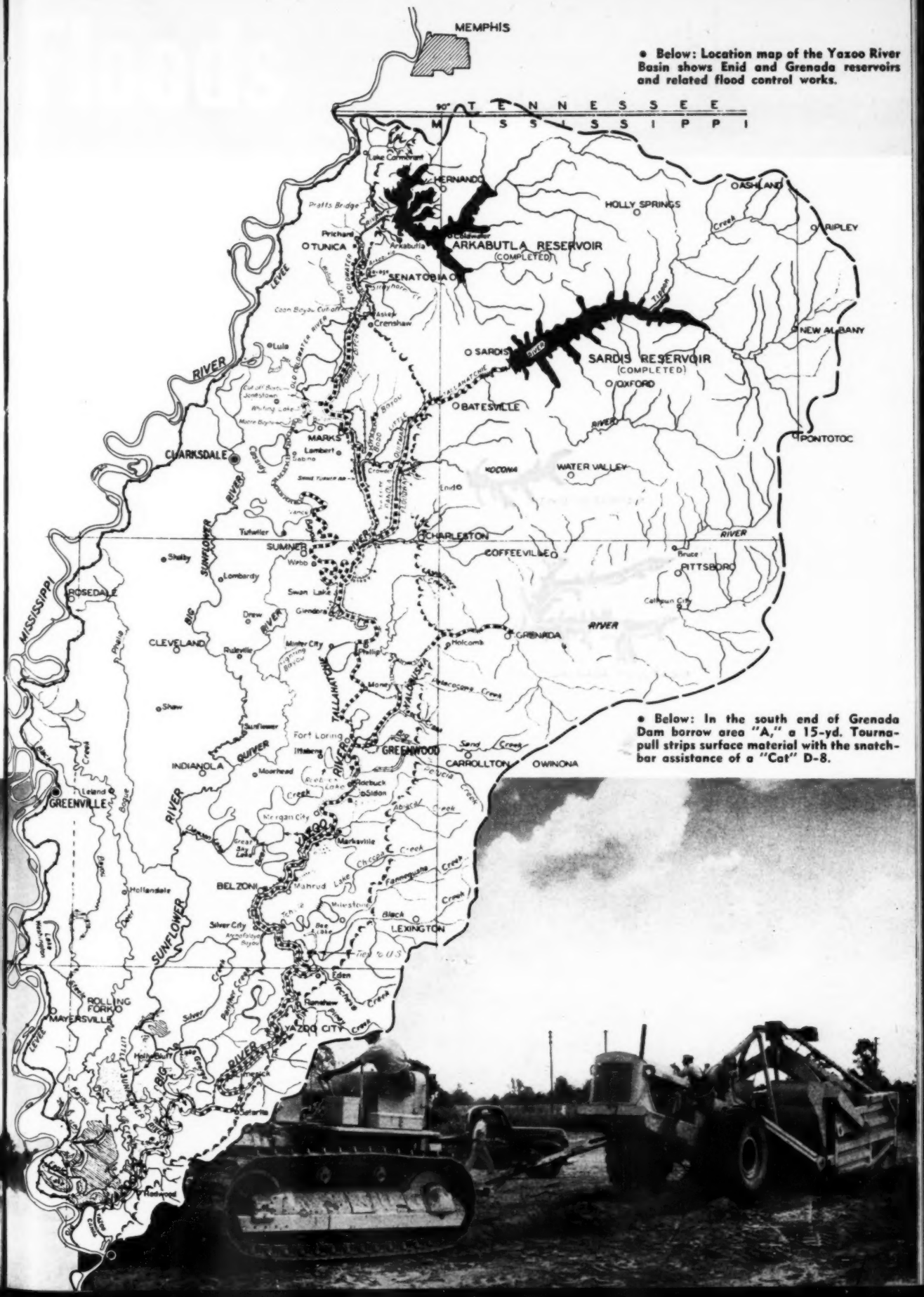
Grenada Dam will be a rolled earth structure, 13,900 feet in length at the top elevation of 256 m.s.l. with a crown width of 40 feet, an average height of 80 feet above the valley floor and a maximum height of 106 feet above the stream bed. The total estimated volume of the embankment is 9,600,000 cu. yds. The upstream slope will be protected from wave wash by a 30-in. blanket of dumped riprap and the downstream slope will be coated with topsoil and sodded.

A toe drainage system consisting of relief wells and collector pipe will be provided along the downstream toe of the embankment for relief of uplift pressure. The relief wells will be constructed of 6-in slotted wood pipe surrounded by a gravel filter and will extend below the surface as much as 60 feet into pervious strata underlying the dam.

As a means of regulating the outflow from the reservoir, a controlled outlet structure will be constructed at the south end of the embankment in the south



• In borrow area "A," just north of Grenada Dam, a 54-B Bucyrus-Erie dragline loads 13-yd. FTD bottom-dump Euclid wagons. The D-8 Caterpillar tractor with LeTourneau bulldozer keeps the pit floor in best possible condition for high-speed hauling.



• Below: Location map of the Yazoo River Basin shows Enid and Grenada reservoirs and related flood control works.

• Below: In the south end of Grenada Dam borrow area "A," a 15-yd. Tournapull strips surface material with the snatch-bar assistance of a "Cat" D-8.

• **Top Left: Gabhard sheepsfoot rollers, drawn by Caterpillar D-8's, tamp fill at downstream toe of Grenada Dam. Canvas hose in foreground carries water for wetting-down of fill before rolling.**

• **Above: Northwest crane sets 54-in. collector pipe in the Grenada toe-drainage collection ditch.**

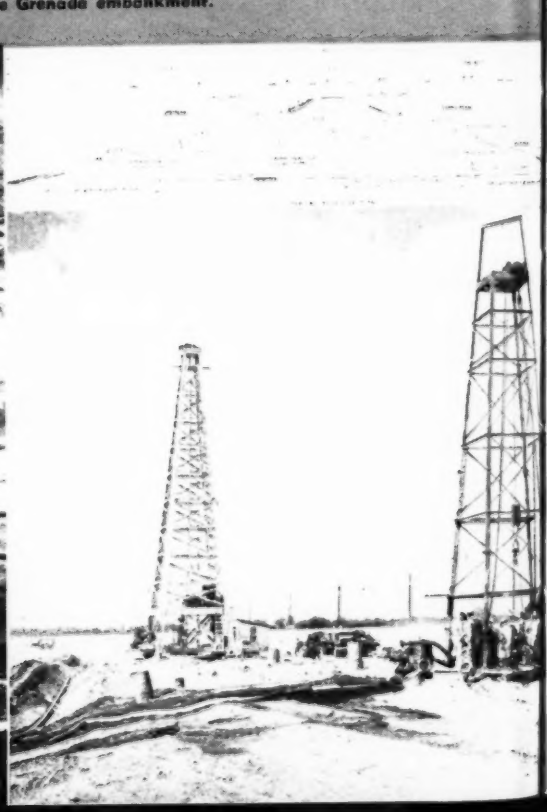
• **Left: Pervious blanket for the downstream toe at Grenada is dumped by a 15-yd. Euclid wagon and spread by a Caterpillar-powered LeTourneau bulldozer.**

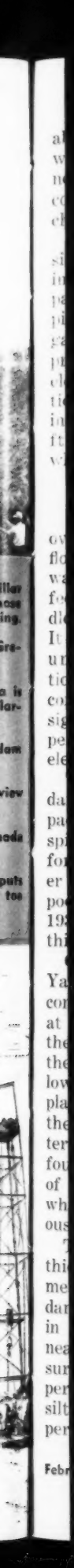
• **Below Left: Euclids swing south along the Grenada coffer dam with their 15-yd. loads of fill.**

• **Bottom Left: Photo taken last December shows general view of project from the north abutment.**

• **Below: Drawing of typical embankment section for Grenada Dam.**

• **Bottom: Rotary drill rig using Buda-Hubron earth drill puts down 24-in. relief wells 30 to 60-ft. deep along downstream toe of the Grenada embankment.**





abutment ridge. The outlet works will consist of an approach channel, intake, transition section and conduit, stilling basin and outlet channel.

The intake structure will consist of the gate tower with hoisting machinery and three gate passages 7.5 x 14 feet with caterpillar-type service and emerging gates. A conservation weir will be provided with crest elevation at elevation 189. The transition section will be approximately 30 feet in length and will lead to the 17-ft. circular conduit, the invert of which will be at elevation 168.

Chute-Type Spillway

To protect the dam from being overtopped in case the maximum flood of record is exceeded, a spillway having a crest length of 200 feet will be constructed in a saddle in the south abutment ridge. It will be of the chute type with uncontrolled crest at elevation 231 and will be of concrete construction. The spillway is designed to discharge 52,000 cu. ft. per second at the surcharged pool elevation of 247.5 feet.

The reservoir created by the dam will have a total storage capacity of 1,251,700 acre feet at spillway crest level, and the lake formed at this elevation will cover 64,600 acres. A conservation pool will be retained at elevation 193 and the dead storage below this level will be 85,700 acre feet.

Grenada dam is located on the Yalobusha River just below its confluence with the Skuna River at a slightly constricted part of the valley. The valley consists of the flood plain of the river and a low terrace which borders this plain on the northwestern side of the valley. In the flood plain and terrace areas of the dam site the foundation at the surface consists of silts, clay silts, and silty clays which form a relatively impervious cover.

This cover is from 30 to 50 feet thick from near the north abutment to near the center of the dam, and from three to 20 feet in thickness from that point to near the south abutment. The surface layer is underlaid by more pervious materials varying from silty sands to clean sands of high permeability. Soils of the north and south abutment and the spillway areas are heterogeneous formations of alterations of clay, shale and sands overlying deep beds of fine to coarse sands.

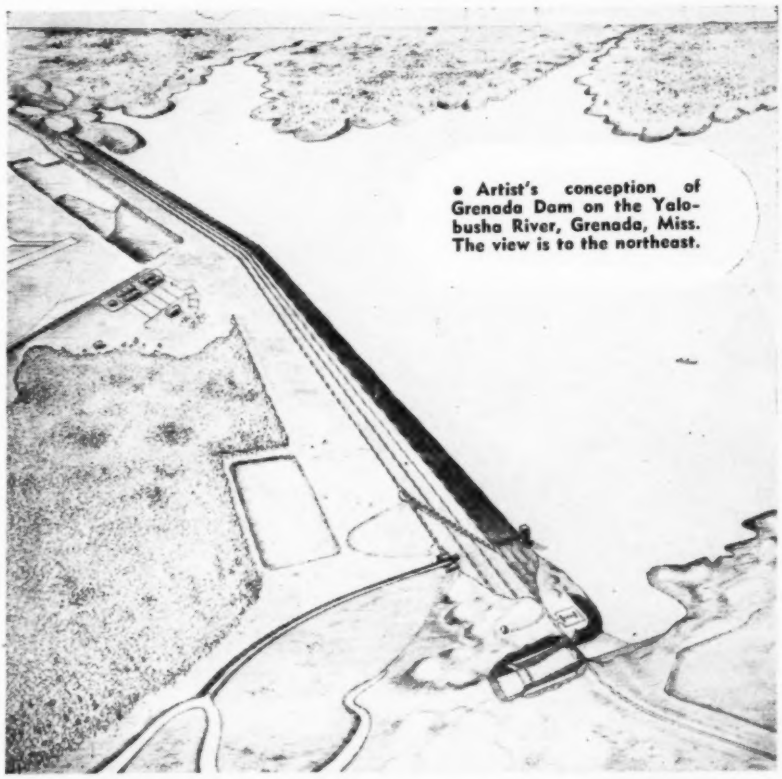
Much Clearing and Relocation

Construction of the spillway and a major portion of the embankment is now underway. Construction of the outlet structures and closure of two gaps to be left in the embankment for the Illinois Central Railroad and passage of the river dring construction will be undertaken at a later date.

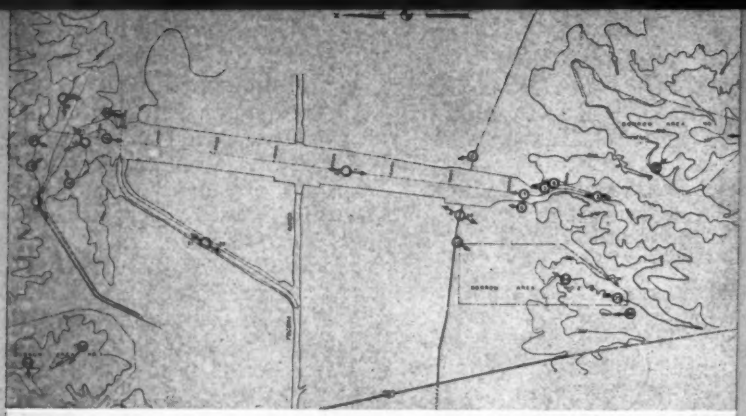
Creation of the reservoir will necessitate extensive clearing as well as the relocation of a portion of Mississippi State Highways 7 and 8, a portion of a main line of the Illinois Central Railroad, a portion of the Mississippi and Skuna Valley Railroad, several county roads, and various power, telephone and telegraph utility lines. In addition, three cemeteries will have to be moved. Contracts for the reservoir clearing and various relocation jobs will also be let at later dates. The cost of the project including right of way and relocations is estimated at approximately $31,000,000.

A contract for construction of the spillway and appurtenant works at the Grenada embankment was awarded January 20, 1947, to Edward E. Morgan Company, Inc., Jones and Gillis, Inc., and Jones-Gillis Contracting Company, Jackson, Mississippi. Work was initiated February 6, 1947 and is scheduled for completion in December of next year. The amount of this contract is $9,154,033.30. R. H. Jones is in charge of field operations and E. E. Morgan acts as project manager for the contractors.

Construction of the relief wells for the downstream toe drainage system of the dam has been subcontracted to Layne-Central Company, Memphis, Tenn. by the prime contractor, and construction of the spillway, has been subbed to the L. A. Tvedt Construction Company, Memphis, Tennessee. In addition, the construction of Cofferdam No. 1 and excavation for spillway structure has been sub-contracted to C. W. Greason & Son and the production of sand from borrow area D-S to Peterman Bros., Co., Yazoo City, Mississippi.



• Artist's conception of Grenada Dam on the Yalobusha River, Grenada, Miss. The view is to the northeast.



• Top: Numbers on sketch of Enid damsite show locations of photographs which have been taken to show progress. Some of these photos are reproduced on these two pages.

• Above: Aerial view taken over the Enid spillway area (photo station 29, approximately) shows progress on the north side of the Yacona River. The old river channel is in the foreground.

• Below: In Enid's borrow area No. 2 (see sketch at top of page), fill material is loaded out by Bucyrus-Erie 54-B (left) and Koehring draglines and a 75-B Loraine shovel.

Excavating equipment being used at Grenada Dam site includes four Super C LeTourneau 15-yd. Tournapulls powered by 150-hp. Cummins diesel engines, three Bucyrus-Erie 54-B draglines powered by 225-hp. Buda diesel engines and swinging 3½-yd. buckets, two Northwest 95 draglines powered by 185-hp. Murphy diesel engines, and a Northwest 8 dragline powered by 185-hp. Murphy diesel engine.

Four 15-yd. LeTourneau FT Scrapers drawn by D-8 Caterpillar tractors, are being used in light stripping operations on the dam foundation and borrow areas, and a 1½-yd. Northwest dragline powered by a Twin City gasoline motor is being used for deep stripping of old sloughs and the old river channel which traverses the dam foundation at several locations.

All excavation is classified as common and there will be approximately 9,500,000 cu. yds. involved in this portion of the dam and spillway. Stripping for the dam foundation will involve approximately 400,000 cu. yds. of additional excavation. At the present time, the contractor is hauling about 25,000 cu. yds. of excavation per day.

Three sources of borrow are designated for the embankment in addition to excavation from the spillway. Materials for the impervious sections of the embankment are being taken from borrow area "A" and "N-A". Materials for the pervious blanket are being taken from borrow area "D-S". Approximately 12 to 15

feet of overburden is being removed by dragline from the "D-S" pit and the pervious material is being pumped into stockpile and allowed to drain prior to hauling to the dam embankment.

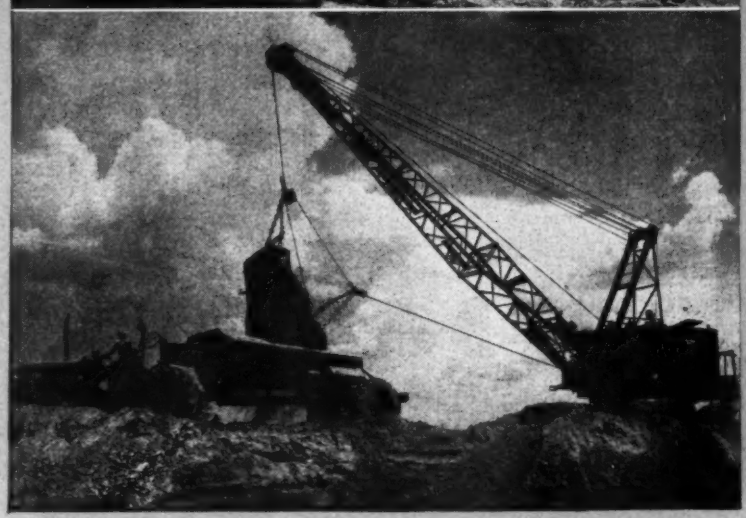
Hauling Equipment

Hauling equipment includes four F-18 Athey 18-yd. crawler wagons drawn by D-8 Caterpillar tractors, four 15-yd. Super C LeTournapulls powered by 150-hp. Cummins diesel engines, four 15-yd. F T LeTourneau scrapers drawn by D-8 Caterpillar tractors, and 50 FDT bottom-dump 13-yd. Euclid wagons—30 of which are powered with 185-hp. Buda diesel engines, 13 with 150-hp. Cummins diesel engines and seven with 165-hp. GM diesel engines.

The contractor has constructed a haul road from the borrow areas "A" and "N-A" along the downstream toe of main embankment following generally the alignment of the maintenance road to be constructed under the provisions of the contract. A spur road connects borrow area D-S to main haul road. The average length of haul is approximately 7,000 feet and at present each unit is averaging about three round trips per hour.

The embankment fill, except for pervious materials, is being compacted in 6-in. layers by means of two Gebhard sheepsfoot rollers and the contract specifications provide for eight complete rollings on each lift. Additional rollings, if required, come under a separate pay item. The pervious portion of the fill is being placed

(Continued on page 69)



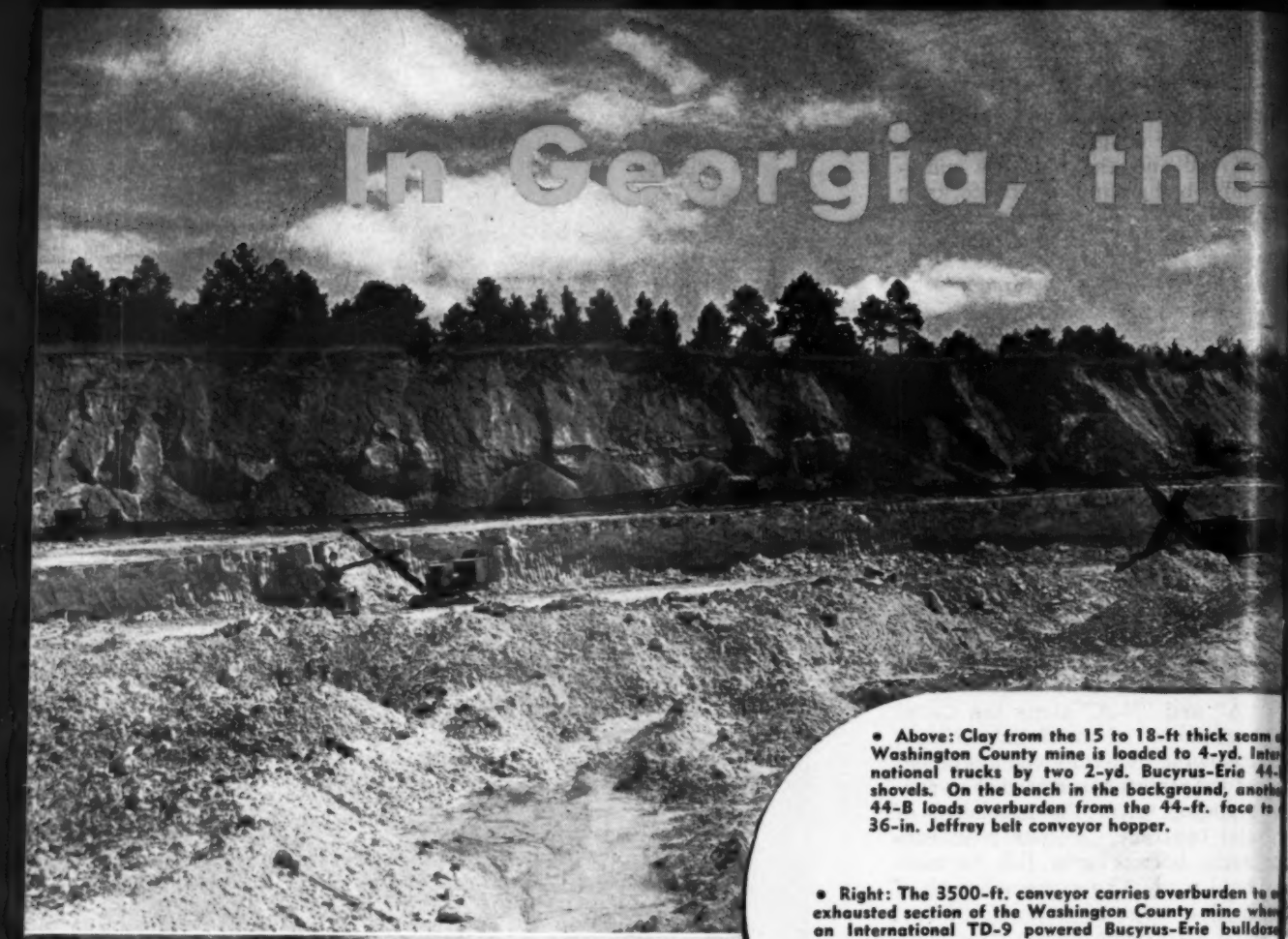
• **Top: Washed pervious material from the Enid washing plant is loaded to a Caterpillar DW-10 hauling wagon by a Koehring 703 dragline.**

• **Above: A 4-yd. bite of material just removed from the Enid spillway area plunks into a 15-yd. Euclid. The dragline is a Bucyrus-Erie 54-B.**

• **Below: Impervious core comes up at picture station No. 7, Enid Dam.**

• **Bottom: General view of dumping, spreading and compacting operations on the main Enid embankment.**

In Georgia, the



• Above: Clay from the 15 to 18-ft thick seam i Washington County mine is loaded to 4-yd. Inter national trucks by two 2-yd. Bucyrus-Erie 44- shovels. On the bench in the background, anothe 44-B loads overburden from the 44-ft. face to 36-in. Jeffrey belt conveyor hopper.

• Right: The 3500-ft. conveyor carries overburden to a exhausted section of the Washington County mine whe an International TD-9 powered Bucyrus-Erie bulldoze spreads the material, making unnecessary frequent mov ing of the conveyor.

• Bottom Left: This dozer handles more tha 1500 yds. a day to spread overburden in the 60 ft. fill at Washington County mine.

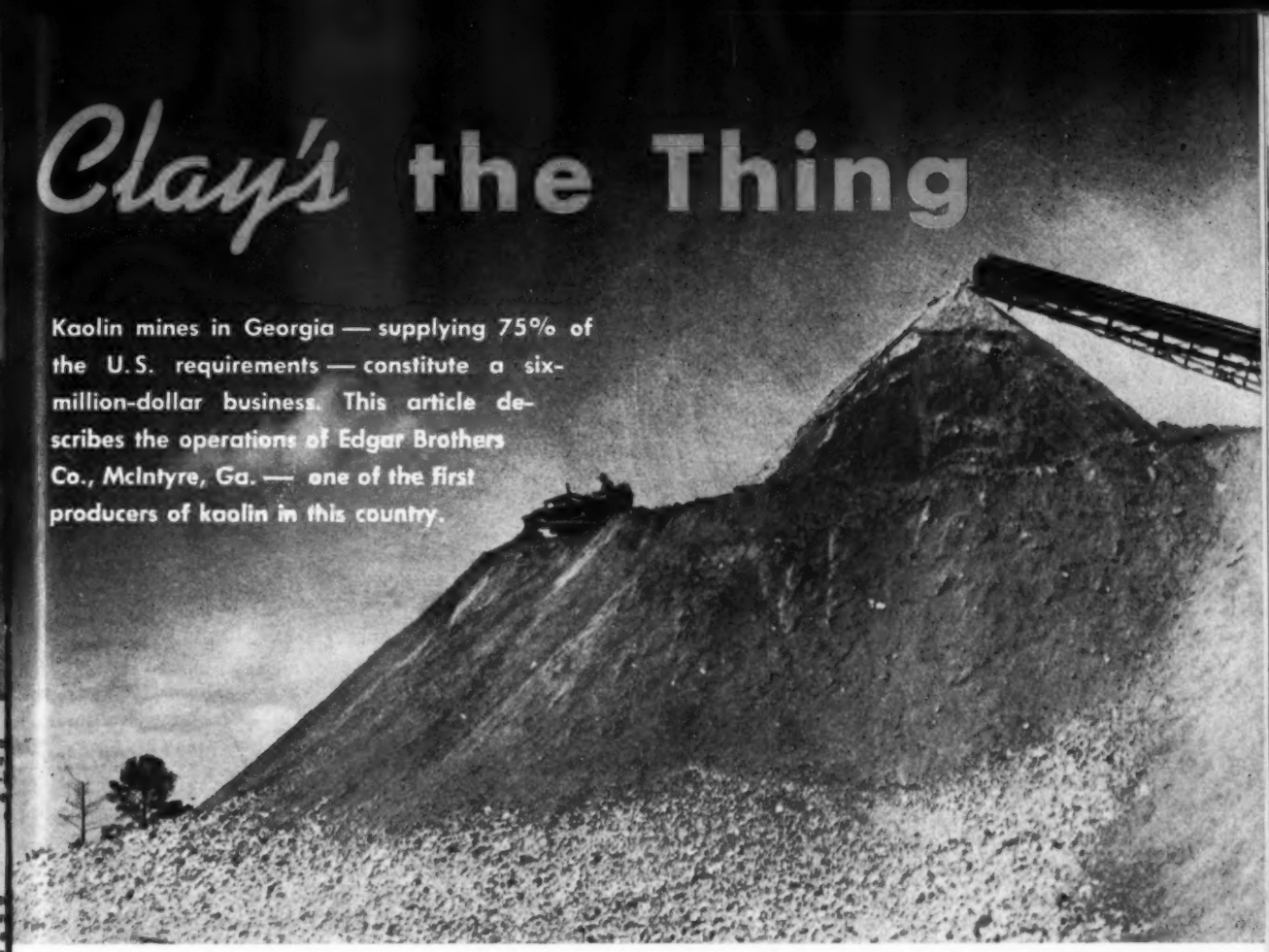
By Albert E. Becker

AMONG the many products excavated from the soils of Georgia, kaolin is one of the most valuable. Georgia produces 75%—with a total annual value of more than $6 million—of all kaolin mined in the United States. The material is essential to the production of most papers, and finds use in many other familiar products.

Prior to the early 1900's, nearly all of our kaolin came from England, where it had been used in the paper industry since the 1860's. In this country, the white clay was first mined commercially in New Jersey by a pioneering family — the Edgar Brothers of Metuchen — using horse-drawn scrapers and carts. But even up

Clay's the Thing

Kaolin mines in Georgia — supplying 75% of the U.S. requirements — constitute a six-million-dollar business. This article describes the operations of Edgar Brothers Co., McIntyre, Ga. — one of the first producers of kaolin in this country.



to the time of the first World War, much of our supply was imported.

When the war's unrestricted submarine attacks all but choked off our shipping lanes, the U. S. paper industry — facing collapse if it could not develop new sources for kaolin — sent out an SOS to the mining industry. The Edgar Brothers Company spearheaded the response by purchasing several large tracts of land around McIntyre (near Macon) Georgia; which region has since become the world's richest producer of china-clay. Edgar Brothers operations now comprise the Klondyke and Washington County mines, two processing plants located at McIntyre and Gardner, Georgia, and new air-conditioned offices, research and control laboratories at McIntyre.

First Used in China

Kaolin, or china-clay, derives its name from a high hill in China where it was first discovered and used for the production of fine porcelains and chinaware early in the 19th century. In general, kaolin is formed by the decomposition of feldspars in granites and the finest deposits of this product are found along the fall line of prehistoric oceans. Edgar Brothers map their underground deposits — lens-shaped, ranging from 12 to 40 feet in depth—from core samples produced by a Buda H. E. deep hole drill.

At their Washington County mine, located about 11 miles from Gardner, Georgia, Edgar Brothers Company uses two 2-yd. Bucyrus-Erie 44-B shovels to strip an average of 30 feet of red-clay overburden. Each shovel strips approximately 1500 cu. yds. per day loading directly into hoppers feeding a Jeffrey 36-in. belt conveyor system.

The conveyor system, powered by General Electric 50 hp. motors, is made up of five separate units linked together and running a distance of 3,500 feet up a 20% grade to the spill. Movable to allow the flow of material from any part of the mining area, the system is at present completing a 60-ft. backfill into an exhausted area. As the conveyor spills the overburden onto this fill, it is leveled and spread out by an International TD-9 powered Bucyrus-Erie bulldozer. The use of the TD-9 eliminates the necessity for frequent shifting of the last conveyor unit.

Scraper Stripping is Newest

Newer areas now being prepared for mining are being stripped of their overburden with three new 8-yd. Bucyrus-Erie S-90 4-wheel scrapers drawn by International TD-18 and TD-14 tractors. These units are working an area ¼ mile square — spreading their loads over low non-productive and exhausted areas immediately adjacent to the present mining site at the rate of more than 385 cu. yds. per 8-hr. day each.

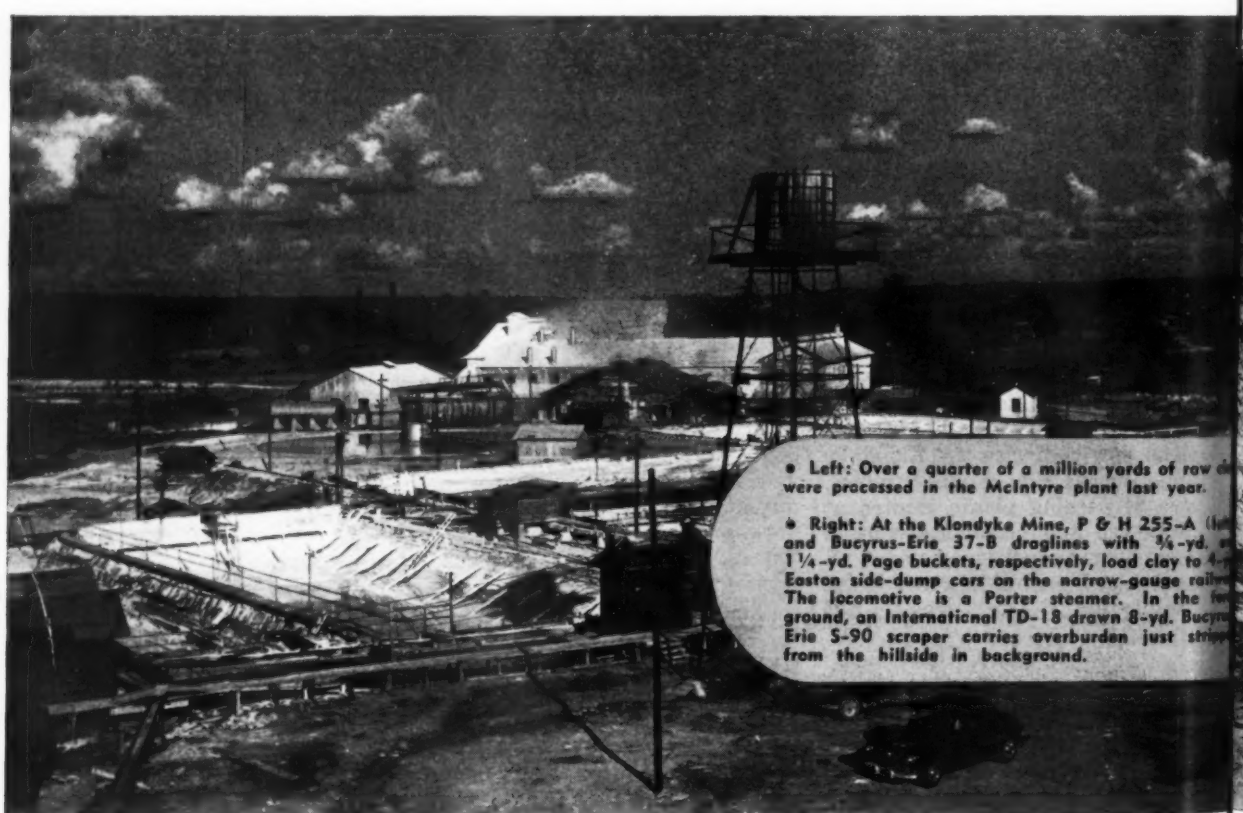
Removal of overburden exposes — usually 15 to 18 feet down — the creamy-white, soft and slightly damp raw clay beds. Two Bucyrus-Erie shovels — a 2-yd. 44-B

• 8-yd. Bucyrus-Erie S-90 scrapers drawn by International TD-18 (left) and TD-14 tractors spread overburden on a 30-ft. fill at the Washington County mine.

and a 1-yd. GA-2 — load this material to eleven 4-yd. International and Ford dumps which haul ½ mile to the disintegration plant.

Both Washington County and Klondyke mines have what is referred to as a disintegration plant where the raw clay is mixed with water into a slurry. At the Washington County disintegrator, this slurry is pumped by an Allis-Chalmers 5x6 centrifugal pump 11 miles through a 6-in pipeline to the processing plant at Gardner, Georgia.

At the Klondyke mine, near McIntyre, Edgar Brothers Company employs two International-



• Left: Over a quarter of a million yards of raw cl... were processed in the McIntyre plant last year.

• Right: At the Klondyke Mine, P & H 255-A (l... and Bucyrus-Erie 37-B draglines with ¾-yd. a... 1¼-yd. Page buckets, respectively, load clay to 4-... Easton side-dump cars on the narrow-gauge railro... The locomotive is a Porter steamer. In the fo... ground, an International TD-18 drawn 8-yd. Bucyru... Erie S-90 scraper carries overburden just strip... from the hillside in background.

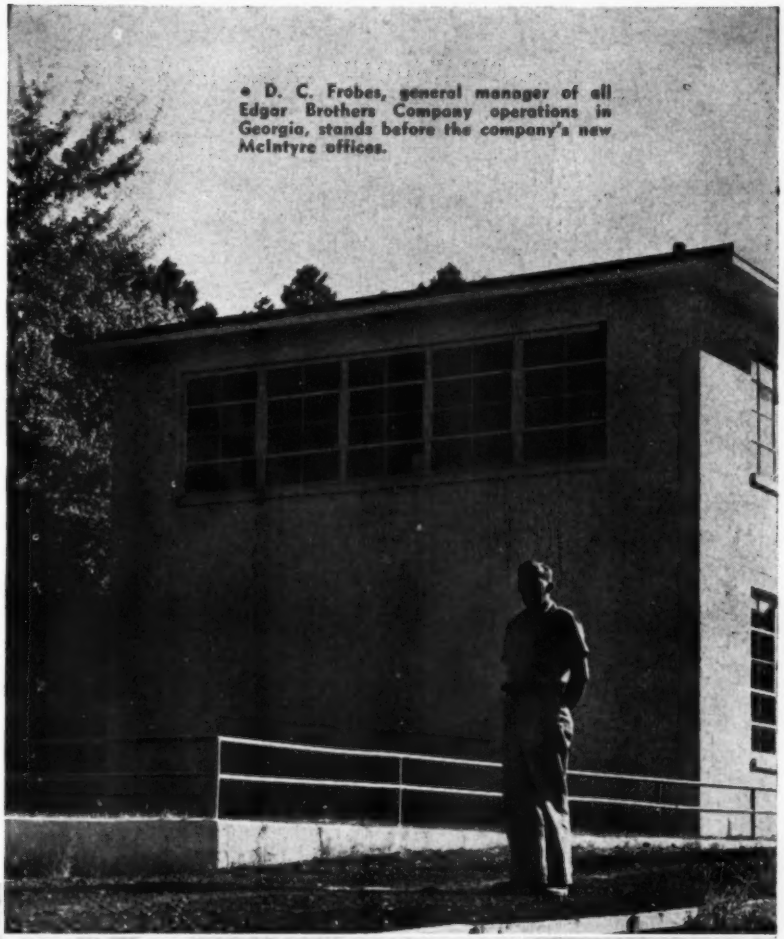
TD-18-drawn 8-yd. Bucyrus-Erie S-90 scrapers to remove 40 to 50 feet of red clay overburden from a hillside deposit. These two rigs excavate and carry more than 1200 yds. of overburden a day ¼ mile to fill in a large swamp.

The raw clay at Klondyke is loaded by P & H 255-A and Bucyrus-Erie 37-B draglines (with ¾-yd. and 1¼-yd. Page buckets, respectively) to a train of eight 4-yd. Easton side-dump cars. Raw material is hauled over a 2-mile narrow-gauge railway by a Porter steam locomotive. Here the clay is mixed into a slurry and pumped by an Allis-Chalmers 6 x 8 centrifugal pump five miles through a 12-in. pipeline to the processing plant at McIntyre.

Processing Plants

The processing plants refine the raw kaolin using a hydro-separation method where 3% fine sands and silicas are removed. The material then passes through Hardinge thickeners and rotary filters, and is dried on a Sargent

(Continued on page 72)



• D. C. Frobes, general manager of all Edgar Brothers Company operations in Georgia, stands before the company's new McIntyre offices.

• **Top Left: Caterpillar D-8 angle-dozers cleared and graded the right-of-way.**

• **Above: International TD-18 tractor with Bucyrus-Erie Bullgrader back fills over the pipe on a rocky, dusty stretch in the Hueco Mountains about 40 miles east of El Paso.**

• **Left: In the open desert, pipe installers, paced by this Buckeye 48 trencher, laid as much as a mile of 30-in. pipe a day.**

• **Below: In certain spots here in the Chino Mountains, west of Banning, the terrain was so rough that tractors often worked up and down the steep slopes chained together like Alpine mountain climbers.**

Digging for the "Biggest Inch"

One of the longest continuous excavations ever made in the United States — the 1214-mile ditch for the "Biggest Inch" pipeline — has recently been completed from the Texas gas fields to the Los Angeles area. This article tells how clearing, excavating, pipelaying, and backfilling work was done by H. C. Price Co. on this $70-million job.

By Mark McMillin

PIPELINE men hail completion of the "Biggest Inch" project as an event rivalling in importance the completion of the first transcontinental railroad. With the laying (scheduled for this year) of an additional 250 miles of piping to Dumas, Texas, a practically continuous pipeline will extend from the Atlantic to the Pacific Coasts, and it will be possible, theoretically, to transport fuel from coast to coast.

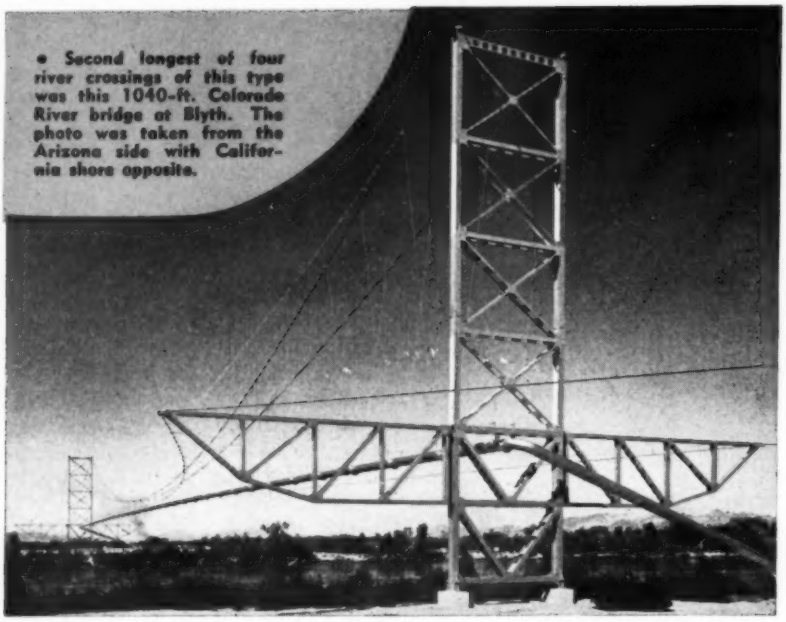
This gigantic project presented numerous problems to the excavating crews, since the ditch traverses all sorts of terrain—swampy irrigated lands, desert sands, steep mountains, canals, rivers, ravines, city streets, sand rock, and orange groves. The rugged, hilly route through the mountains required the use of what is believed to be the greatest assembly of dirt-moving equipment ever used on a pipeline right-of-way.

The new pipline is the largest diameter high-pressure gas transmission line ever built — hence its popular name, "Biggest Inch." It was constructed in two sections. The 30-in. pipe was installed from the California state line near Blythe, to Santa Fe Springs, in the Los Angeles area. This line is 214 miles in length, and was constructed by the Southern California Gas Company and the Southern Counties Gas Company of California. The remainder is a 26-in. line installed by the El Paso Natural Gas Company.

The general contract for the "Biggest Inch" was let to the H. C. Price Co. of Los Angeles, California, and Bartlesville, Oklahoma, with hauling and stringing of pipe subcontracted to Dunn Bros. of Dallas, Texas, the only sub-contractor on the project. Work started early in January, 1947, and dedicatory services were held in Los Angeles last November 13, at which time gas was first turned into the line. The total cost of the project was $70,000,000.

The purpose of the pipeline is to provide additional natural gas for Southern California. The supply of natural gas available for distribution to meet peak demands in California has become alarmingly inadequate during the past several years, and authorities estimated that the peak day demand in this district might exceed the available supply by 1949,

• Some of the rough going in Apache Pass. Equipment such as these International-mounted pipe-wrapping machines worked well in the most difficult terrain.



• Second longest of four river crossings of this type was this 1040-ft. Colorado River bridge at Blyth. The photo was taken from the Arizona side with California shore opposite.

unless steps were taken to tap other sources.

Use Gas Formerly Wasted

In order to bring in an out-of-state supply to augment California reserves, officials of gas companies decided to build the huge pipeline to tap the world's largest know sources of natural gas—the Hugoton and Panhandle dry gas fields, which cover parts of Texas, Oklahoma, and Kansas, and the Permian Basin located in West Texas and New Mexico. The Hugoton and Panhandle fields have estimated recoverable gas of approximately 40 trillion cubic feet, and a proven area exceeding 4,200,000 acres; while in the Permian Basin, for the lack of a market, up to 400 million cubic feet per day of raw and residue oilwell gas has been flared at wells and gasoline plants.

The ultimate capacity of the new line will be 305 million cubic feet a day, or the weight equivalent of 7,625 tons. The line will not be operating at full capacity until early next year, although delivery of gas began last November. Gas rights have been contracted for a period of 30 years.

• In most places, the Buckeye 48 ditchers prepared a 40-in. trench five feet deep.

The project, because of the diversity of terrain to be excavated, called for constant changes of pace, and provided strenuous tests for equipment and methods under difficult and varied conditions. It is believed that more bulldozers, angle dozers, and other types of dirt-moving equipment were used on this job than have ever before been engaged in making pipeline right-of-way. This was necessary because of the rough and hilly terrain encountered both on the desert and in the mountains, including broken brush-covered Badlands, high rolling, grass-covered hills, fields of irrigated alfalfa and other crops, orange and walnut groves, a few miles of country roads, and 11 miles in a railroad right-of-way.

In addition, the project included ten river crossings, of which five were understream, one was the truss type, and four were suspension type. The longest bridge was the Canadian River Crossing, which extends 1200 feet between towers, and is 40 feet above the river.

Traverses Scenic Section

The route of the California sector of the project traverses some of the most varied and beautiful country in the nation. Leaving the Colorado River at Blythe, the route crosses the Palo Verde Valley, and the upper Colorado Desert, which is sparsely grown with sage, ocotillo, and mesquite. The major part of the remainder of the line traverses extremely rugged foothill country in the Badlands west of Banning and in the Chino Hills, until it finally emerges in the alluvial plain of Santa Fe Springs.

Among the chief construction problems encountered in the desert areas were the lack of water and the terrific heat, which at times reached a mid-day peak of 130 degrees. Because of the lack of water, it was necessary to haul every drop for both men and equipment for great distances, often as far as 50 miles. In the desert between Blythe and Banning, the heat was so intense that the protective pipe wrapping was damaged. To overcome this difficulty, the pipe was whitewashed, thus cutting down its tempera-

ture to slightly more than that of the air.

The major job involved in bringing the line across the mountains was grading of the right-of-way to the extent necessary to accommodate the ditchers and other construction equipment. The right-of-way generally extended 20 feet to the left of the pipeline location (this portion for the spoil bank) and 30 feet to the right (the working strip).

At the same time, all necessary additional access roads were constructed or existing roads improved to permit hauling the 60-ft. pipe sections. In many places, "shoe-fly" roads were required to move the equipment around deep canyons and gullies.

Right-of-Way Grading

The ground — which varied from fine river silt, through loam, fine and coarse gravels, and sedimentary rocks, to granite — presented a real problem to the contractor, both in grading the right-of-way and in ditching. Caterpillar D-8 bulldozers were used in the grading operations, the number required varying with the roughness of the country and the type of soil. In some sections, one tractor was capable of making several miles of finished right-of-way per day, while in another section seven bulldozers were able to complete less than one mile per day. The right-of-way was graded in such a manner as to eliminate as many angles as possible.

The right-of-way clearing crew was equipped with ten Caterpillar D-7 and D-8 angle dozers with winches. On the desert, this crew cleared right-of-way at the rate of five miles a day, but in the mountains and badlands, did well to make 1000 feet a day. Preliminary studies indicated that the Chino Mountains would be perhaps the most difficult going a pipeline crew had ever tackled, and job experience bore this out.

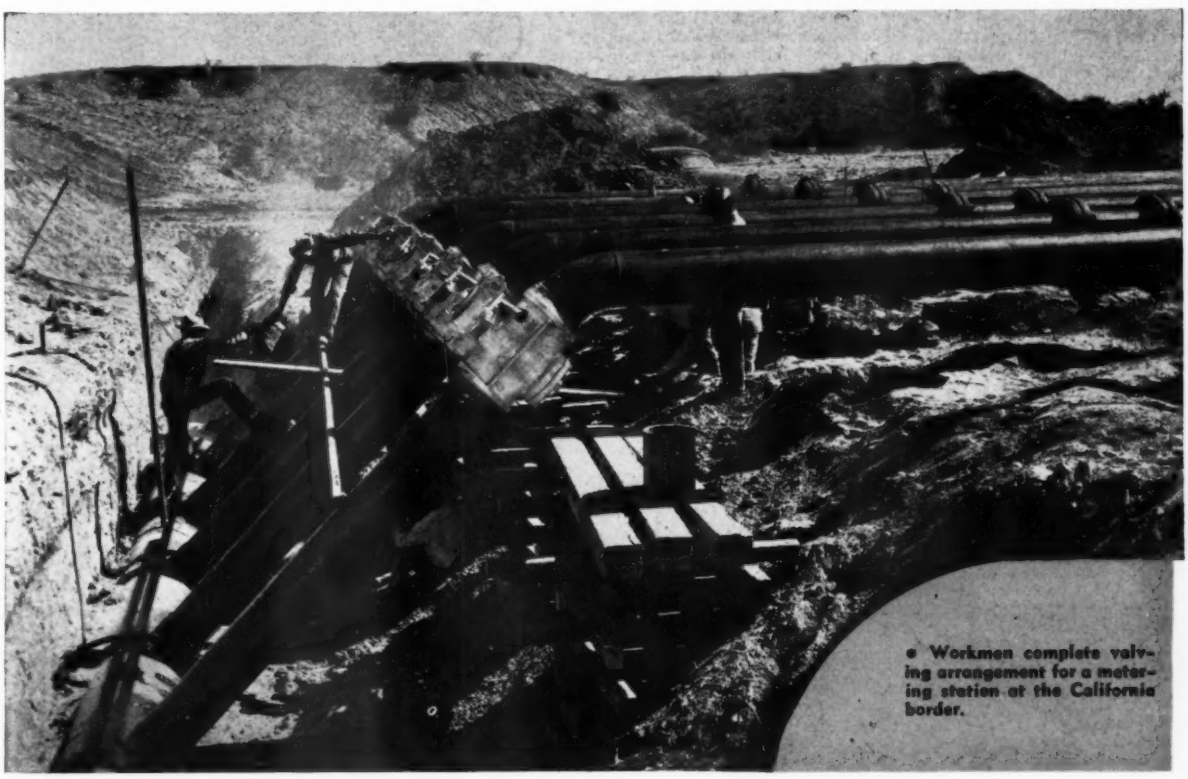
Trenching was done with Buckeye 48 trenchers, except in rock and coarse gravel, where drag shovels were used. In general, the 40-in. trench was dug five feet deep, except in sections where the line was laid at a depth up to ten feet as a protection against possible wash-outs.

In the first eight miles through the Palo Verde Valley — which is extensively irrigated by water from the Colorado River — the crew found that the water table was in many places only 18 inches below the ground surface. The high water-table in sandy soil caused the ditch walls to cave in, necessitating the use of numerous clamshells and draglines in order to excavate the ditches.

Lowering of the heavy pipe was done by six D-7 and D-8 Caterpillar tractors in each spread using special 24-ply fabric and rubber slings.

Experience on the job proved that the shorter-boomed D-7 can be used safely within 8 to 10 feet of the ditch without danger of causing cave-ins. Each spread used two Buckeye 48 ditchers, and particularly hard-digging was done by 14 Lima, Buckeye, and Insley draglines, all with drag-shovel attachments and buckets sized from ½-yd. to 2½-yd.

Replaceable hard-surfaced bucket teeth were used for digging through decomposed granite or boulder beds found in some sections, especially in the mountain regions. It was necessary to replace the teeth frequently, sometimes as often as at intervals of 150 feet where the going was par-



• Workmen complete valving arrangement for a metering station at the California border.

ticularly rough. The ditch, when completed, necessitated the moving of more than 700,000 cu. yds. of dirt, sand, and rock, in the California sector alone.

Much of the work within the city of Blythe had to be done in a confined and narrow right-of-way. In this locale, it was necessary to cross 11 main irrigation ditches underground. Pipe casing of 36-in. diameter was installed under each of these canals. In order to safeguard against the danger of the canal-dikes washing out and flooding the area, the crew first found it necessary to drain and dry the ditches before making casing installations.

Caving Problems in Desert

West of the desert city of Blythe, caving of ditch walls occurred in many stretches of sandy deposits. However, the use of slopers on the sides of the ditcher wheels, which cut two feet down and a foot back, held sand-caving to a minimum over most of the route. The desert sands made necessary the use of all-wheel drive on trucks on this phase of the job.

From Blythe, the great ditch followed U. S. Highway 60-70 across the desert, took off west of Banning, crossed the Badlands, then headed due west to Corona. From here, it continued up across the precipitous Chino Mountains to Brea, then followed the Pacific Electric Raildroad Company's tracks to Los Neitos and Santa Fe Springs, which was the Los Angeles area terminal of the ditch.

Despite the fact that the "Biggest Inch" is the largest high-pressure gas transmission line ever built, routine pipe-laying techniques were, in general, utilized. The pipe-stringers, Dunn Brothers of Dallas, Texas, only sub-contractors on the job, started hauling the pipe late in October, 1946. Specially-built pipe trucks, designed to haul five joints of the 60-ft. lengths of yard-coated pipe in a load, made the trip from the Maywood plant of the Consolidated Steel Corporation overnight. Each truck-load of pipe weighed 15 tons.

"Gamma Ray" Inspection

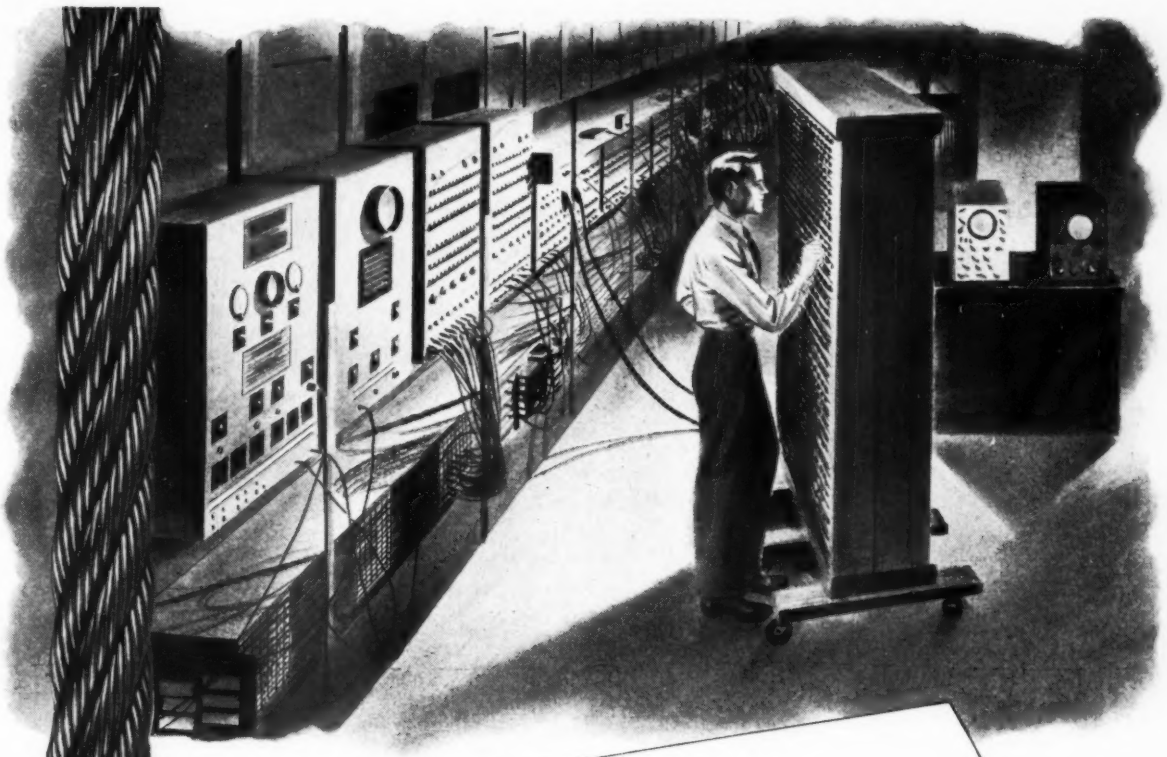
A new departure from the normal method of checking field welds — developed in wartime ship welding — was used on the Biggest Inch. Welds were gamma-rayed immediately, films developed in a portable field-laboratory which followed the welding crew, and the results made known to the welding foreman within an hour. By this method, the welders' workmanship was closely checked, eliminating all other welding inspection and insuring a first-rate job.

The method of fabrication at the Maywood plant represented a new departure on the Pacific Coast. A section of pipe entered the production line as a flat manganese steel plate, 92 inches wide, 30 feet long, and weighing about a ton and a half. The pipe was rolled cold — heat played no part whatever in its fabrication, except at the welding station, where it was used to fuse the metal to form the weld.

Because this was the largest high-test pipe ever fabricated, engineers set up more rigid tests at the Maywood plant than those usually applied to the materials for a pipe line. The pipe, includ-

(Continued on page 64)

• On the flats east of Texas Canyon, Arizona, the job was "duck soup." All operations could be carried out in proper sequence with one crew following another in near-ideal fashion.



Precisionbilt LIKE AN ENIAC*

J&L WIRE ROPE

PERMASET PREFORMED

Like an ENIAC,* J&L Wire Rope is Precisionbilt to save you time and money. J&L rope is made of J&L Controlled Quality Steel to last longer and reduce the down time of your equipment. It is a wise economy to standardize on J&L Precisionbilt Wire Rope for all uses. Specify it on your next order.

**The ENIAC (Electronic Numerical Integrator and Computer) is a phenomenal "thinking" machine that does in seconds scientific and engineering calculations which would require weeks—even years—if done with pencil and paper by trained computers.*

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

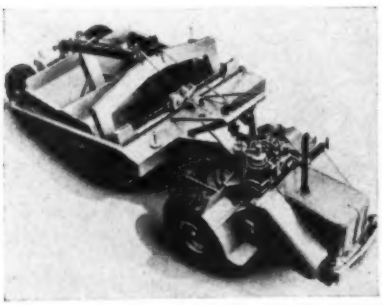
PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

Equipment you ought to KNOW ABOUT

"Terra-Cobra" Earthmover

Manufacturer: Wooldridge Manufacturing Company, Sunnyvale, California.



Claims: According to the manufacturer, the new 200 h.p. "Terra-Cobra" high-speed, self-propelled earthmover, model TC-S14, has been developed to meet the demand for greater power on earthmoving operations.

Increased power enables the new "Terra-Cobra" to climb steeper grades and traverse soft mud, sticky clay, and loose sand under heavily loaded conditions with ample tractive pull and minimum gear shifting.

The new model also incorporates a larger clutch and heavier duty transmission to deliver maximum power on the drive wheels.

Twin Jaw Crushers

Manufacturer: Iowa Manufacturing Company, Cedar Rapids, Iowa.

Claims: A line of jaw crushers with two movable jaws is now in production. The twin jaws are operated by two eccentric shafts and a double set of flywheels. This is reported to provide not only greatly increased capacity over an ordinary jaw crusher but also smoother operation because of the nearly 100% balanced rotary motion.

All Position Electrode

Manufacturer: Wilson Welders and Metals Company, Incorporated, New York 17, New York.

Claims: The improved Wilson No. 512 all position, mild steel electrode is designed to produce weld metal possessing not only excellent mechanical properties, but also low hydrogen content.

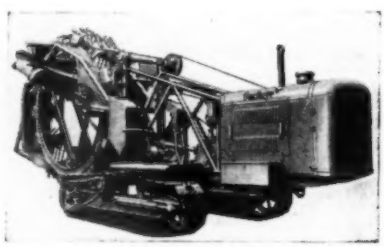
This improved electrode has two advantages over its predecessor in that it can be used on AC and DC reverse polarity current with operating characteristics being equal. Secondly, preheating of this electrode is no longer required to obtain porosity-free weld deposits.

"Buckeye" Ditcher

Manufacturer: Gar Wood Industries, Incorporated, Findlay Division, Findlay, Ohio.

Claims: The "Buckeye" Model 312 Ditcher, which succeeds the Model 12, has just been placed on the market.

This new ditcher, on which the



company has been working since the end of the war, has been subjected to prolonged field tests — in actual service in various parts of the country. The unit can cut ditches 16 inches to 30 inches wide and up to 6 feet deep.

The Model 312's diesel engine develops 67 h. p. at 1,600 r. p. m. A fluid coupling in conjunction with a friction clutch permits loads to be picked up or relieved with either or both. Digging speeds up to 57.5 feet per minute are provided.

"Twin Barrel Lifter"

Manufacturer: Merrill Brothers, Maspeth, New York.

Claims: This dual clamp for lifting metal barrels is an adaptation of the regular "Volz Clamp." The device consists of a cross arm of the width of the standard barrel, with a "Volz Clamp" attached to both ends of the arm. The center of the cross arm is provided with a ring through which the hook of the hoist or other lifting tool is attached.

Heavy-Duty Jacks

Manufacturer: Blackhawk Manufacturing Company, Milwaukee 1, Wisconsin.

Claims: Two new heavy-duty hydraulic jacks, the 30-ton FB-11 and the 50-ton GB-11, are now in production. These models combine the load pump and speed pump into one unit. The load pump cuts in automatically when the speed pump has raised the saddle to the load.

Among the features included are a recessed safety release valve, overall closed construction, ports for gauge or valve installation, pump beam protection.

"ATECO" Bulldozers

Manufacturer: American Tractor Equipment Corporation, Oakland 3, California.

Claims: Three new heavy-duty bulldozers, especially designed for Case industrial wheel tractors, are new being offered by ATECO.

These bulldozers are securely

fastened to the tractor at the transmission case, drawbar pad, and rear axle housing. Blade and push members are built to take the full drawbar power of the Case tractor in rough work. Push members are pivoted above the rear axle so part of the working

you get more work out of Mack Trucks

Built-in durability plus exclusive features of design explain the stand-out performance of Mack trucks on punishing excavation jobs. Mack Model LR, specially engineered for this service, is proving to cost-conscious contractors like Frank Donatelli & Sons, Pittsburgh, Pa., that a Mack on the job means more work done on the job.

because . . we put more work into Macks

Mack trucks for off-highway service take the toughest terrain in stride. Whether it's uneven ground, slippery mud or sand, Mack's exclusive Power Divider assures good going by effectively transferring power to the wheel having the best traction. Two distinct types of the Power Divider are available, one for four-wheel trucks (shown here) and another for six-wheelers.

Mack

trucks for every purpose

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.

6219-3

SINCE 1900, AMERICA'S HARDEST-WORKING TRUCK

load is transferred to the rear wheels to increase traction.

Push members do not interfere with tractor steering; front wheels will turn in normal tractor radius even when blade is in dozing position and below ground level.

Blade is powered both up and down by front-mounted hydraulic pump, which assures constant power without gear shifting.

Compressor-Winch Assembly

Manufacturer: Davey Compressor Company, Kent, Ohio.

Claims: This new truck-mounted "Auto-Air" compressor-winch assembly has just been developed. Power for operation of both compressor and winch is transmitted from the truck engine by a Davey "Heavy Duty Power Take-off" installed in the truck's drive shaft. Countershaft with two individual Twin Disc clutches provides for either simultaneous or separate operation of compressor and winch.

The compressor delivers 105 c.f.m. at 100 lbs. pressure. The winch is of 25,000 lb. capacity.

Heavy-Duty "Tournahauler"

Manufacturer: R. G. LeTourneau, Incorporated, Longview, Texas.

Claims: The new heavy-duty electrically-powered "Tournahauler" is designed to solve on-road, off-road hauling problems.

Mounted on large rubber tires, it is said to have the power and traction to negotiate almost any type of rough going, with loaded capacities ranging from 20 to 100 tons. Equipped with a new "Tournamatic" differential, it is claimed that greater traction is obtained by causing the drive wheel with the greatest traction to pull several times harder than the other. The most power is supplied to whichever wheel is on the firmest footing.

Positive steering power for the unit is controlled by means of small micro-switches on the dash board. The two-wheeled prime mover is diesel-powered with electric starter. A No. 2, 50 KVA, in-line generator, driven off the engine, supplies current to an electric motor, operating a gear on the yoke king pin, which steers the prime mover and trailer as a locked integral unit.

Hydraulic Crane

Manufacturer: Day-Smith Hydraulic Crane Corporation, Camp Hill, Pennsylvania.

Claims: The Lugger Crane, a hydraulic unit which is said to provide exceptional utility at low cost, is now in production.

The new crane can lift and carry up to 6,000 pounds. Ten feet of vertical boom travel is provided, with a corresponding cable travel of sixteen feet. Maximum clearance under hook is eighteen feet.

All movements of the crane are controlled by one man from the driver's seat by a system of "Daybrook" hydraulics.

The unit is mounted on a half-track chassis, which is equipped to perform a variety of towing and pushing operations, in addition to lifting and carrying.

Rubber Wader

Manufacturer: B. F. Goodrich Company, Akron, Ohio.

Claims: This new rubber wader is designed for use by workers in damp, wet, or muddy locations.

Rubber used in the construction of the wader has maximum abrasion resistance. It is made in one pattern with shoe sizes from 8 to 11 inclusive. All seams are cemented and strapped, and the crotch seam is fully reinforced with rubber. Boots have a cleated sole and molded heel.

"Blaw-Knox" Finisher

Manufacturer: Blaw-Knox Company, Pittsburgh, Pennsylvania.

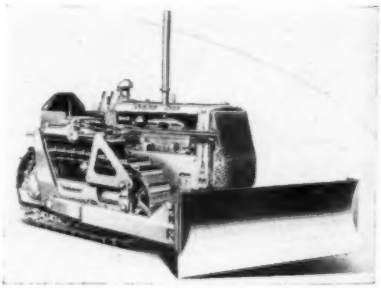
Claims: One of the new features incorporated in this improved widening finisher is a unit, automotive type transmission with all parts running in oil. An oversize ball bearing clutch and a simplified shoe type steering device have also been included.

This widening finisher is of the single screed type with widths adjustable from two to six feet by changing the screed wings. The machine has one forward traction speed suitable for all normal work and one high reverse speed. It has two screed speeds to accommodate concrete of different textures.

Hydraulic Angling Bulldozer

Manufacturer: Caterpillar Tractor Company, Peoria 8, Illinois.

Claims: The "Caterpillar" No. 4A, angling type, hydraulic controlled bulldozer, designed for exclusive use with the "Caterpillar"



diesel D4 track-type tractor, has been placed in production.

Equipped with the closed type hydraulic system, the No. 4A is offered with an 88-inch blade for the 44-inch gauge D4, and with a 108-inch blade for the 60-inch gauge tractor. The blade has a 31-inch lift above the ground with the blade straight while, with the blade angled but not tilted, the front point will lift 37½ inches with the smaller gauge, and 38½ inches with the wider gauge. The maximum blade pitch adjustment

(Continued on page 68)

HOW TO DIG A DITCH— AND NOT GO IN THE HOLE

Yager and Sons, Beaverton, Michigan, call the 3-cylinder GM Series 71 Diesel that powers this shovel "just about the best power we've ever used." Inset shows Mr. Fay Yager, in charge of the shovel operation, who says, "You fellows just don't boast enough about that GM Diesel engine."

Shown here is a General Motors Diesel-powered Bay City ¾ yard shovel. It's doing the toughest part of a pipe-trench job—mile after mile of 6′ by 12′ trench—cutting through wet sand, swamp mud, pulling stumps, digging in the roughest kind of terrain.

Taking jobs like this in stride is everyday work for GM Diesel-powered equipment. The 2-cycle GM Diesel gives instant response to widely fluctuating power demands, operates on low-cost fuel, and delivers long, economical service.

No wonder so many operators rely on GM Diesel power to help them trim costs on close-figured contracts. You, too, will find it pays to specify GM Diesels for repowering old equipment or when buying new. Write today for complete details.

DETROIT DIESEL ENGINE DIVISION

DETROIT 28, MICH. ● { SINGLE ENGINES . . Up to 200 H.P. / MULTIPLE UNITS . . Up to 800 H.P.

GENERAL MOTORS

GM
GENERAL MOTORS
DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

Shots from the FIRING LINE

State Road Work Up $150 Million, PRA Survey Shows

Improvement of the Nation's highways proceeded at a faster pace in 1947 than in the previous year, according to reports received from State highway departments by the Public Roads Administration of the Federal Works Agency.

Reviewing the progress of the highway program, Public Roads Commissioner Thomas H. MacDonald said contract awards authorized by the States during the year called for $895,000,000 worth of work on 44,700 miles of road. This was approximately $150,000,000 more than the cost of road construction contracted for in 1946.

The 1947 total included contracts for Federal-aid projects to cost $640,000,000 and 19,800 miles in length. Expenditures for State-administered highway work under way during the year amounted to approximately $890,000,000.

$750 Million Aid Total

At the year's end, Commissioner MacDonald said, Federal-aid projects costing more than $700,000,000 were under construction, and plans had been approved for additional projects costing around $350,000,000, on which work is expected to start this year. The total estimated cost of Federal-aid projects programmed by the States for construction but not yet advanced beyond the planning stage was nearing $750,000,000.

The urgent need for better highways throughout the Nation was emphasized by steadily mounting floods of traffic on main rural roads and urban thoroughfares. Motor vehicle registrations in 1947 are estimated to have exceeded 37,000,000 setting an all-time record. This was approximately 3,200,000 more than the 1946 total and 2,644,000 above the number of motor vehicles registered in 1941, the previous peak year.

Travel on rural highways during the year was estimated at 187 billion vehicle-miles, an increase of approximately 10 per cent over the volume of rural travel in 1941.

The increasing use of highways for commercial transportation was reflected in the fact that truck registrations rose from 4,859,244 in 1941 to an estimated total of 6,500,000 in 1947, an increase of around 33.7 per cent. The increase over the 1946 total of 5,725,692 registrations was approximately 13.5 per cent.

Truck hauling on rural roads during the past year was estimated at 86 billion ton-miles, as compared with a total of 73.5 billion ton-miles in 1946.

With traffic congestion steadily becoming more serious, one of the most important developments in 1947 from the standpoint of the average motorist was the designation of a 40,000-mile interstate system of highways which eventually will be improved to high standards, Commissioner MacDonald said. The system includes routes carrying large volumes of traffic into and through cities.

Commendable progress was made by the States, in cooperation with municipal authorities, in the planning and actual start of construction on expressways designed to speed the flow of traffic in urban areas and at the same time reduce accident hazards, Commissioner MacDonald added.

Work was begun during the year on urban expressways and multi-lane rural highways in Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, the District of Columbia, Florida, Ohio, Texas and California. In other States plans for expressway projects were well advanced, and initial contracts are expected to be let in the near future.

Commenting on contract price trends, Commissioner MacDonald noted that construction costs for various classes of road work have risen eighty to ninety-three per cent above 1940 costs.

• Typical of progressive soil conservation practices throughout the nation last year was this method of filling a badly eroded ditch on a farm in Karnes county, Texas. Soil conservation officials (watching the performance of a Goodyear-tired Caterpillar 12 motor grader) found that pneumatic-tired vehicles gave superior compaction and finish in this type of work.

AED Meeting in Chicago

Preliminary reports for the 29th Annual Meeting of the Associated Equipment Distributors in Chicago, February 15 to 19, indicate heavy attendance by both distributor and manufacturer members, according to Frank C. Knight, Executive Secretary. Hotel reservations made through the Executive Office in Chicago exceed 1,400, and the total attendance is expected to be well above this number since some members make their own reservations.

A large group from Canada together with members from England and Mexico promise to add an international touch to the meeting. Meeting headquarters and all business sessions will be at the Edgewater Beach Hotel.

Moles Society Honors Gen. Wheeler, W. A. Durkin

Formal presentation of bronze plaques and citations to Lieutenant General Raymond A. Wheeler, Chief of Engineers, U. S. Army and wartime Commander of the India-Burma theater of operations; and William A. Durkin, president of the Walsh Construction Co., builder of New York's Queens-Midtown vehicular tunnel under the East River and other notable engineering structures; was made at a dinner ceremony of the moles in New York City, February 4th. The annual awards

(Continued on page 40)

...Le Roi announces the Model 52 Paving Breaker

...its new, easy-holding action packs a wallop that saves you money

Here's a new paving breaker that you must try. Our tests, and they've been tough, indicate that this machine reduces the cost of breaking concrete. The 52 is truly a champion — these features guarantee it:

● **A knock-out punch that puts "high costs" down for the count.** Le Roi's 52 breaker has a happy combination of bore, stroke, valving, and timing that produces its highly effective concrete-shattering blow.

● **Easy to handle.** The 52 weighs 80½ pounds. Overall length is only 29 inches, and handle width 15 inches — operators can move it around with less effort. Rubber hand grips, a new valve action, and an air-cushioned front end minimize vibration. A latch-type retainer makes steel-changing easy.

● **A bear for punishment.** Sturdy drop forgings are used throughout. The throttle valve has a replaceable bronze bushing. The slug-type piston is reversible, a feature that adds many hours of operation to its life. A generous oil reservoir and a new type of lubrication system helps maintain peak operating efficiency — *the 52 is the first breaker to introduce positive shank oiling to increase chuck-bushing life.* A generous bearing giving full support for the full length of the tappet stroke, maintains alignment, and eliminates tappet spalling. A swivel hose connection increases the life of the hose.

● **A miser when it comes to using air.** You can run Le Roi's Model 52 off any standard 60-foot compressor. The 52's new end-seating valve meters the air sparingly without weakening the force of blow — and it actually improves with use, assuring efficient dependability.

The frost will be out of the ground before long — so see your Le Roi distributor about delivery of Model 52's for your spring work.

Write us for literature.

SPECIFICATIONS

Weight, lbs.	80½
Length, inches	29
Width, inches	15
Standard Shank size, inches	1¼ x 6*

*1⅛" x 6" shank also available. Sheeting driver frontheads can be supplied for 2, 2½, and 3-inch piling. Spike driver frontheads are also obtainable.

LE ROI COMPANY

MILWAUKEE 14, WISCONSIN

NEW YORK • WASHINGTON • CLEVELAND • BIRMINGHAM
TULSA • BUTTE • SAN FRANCISCO

RD-15

Take a round out of pavement-breaking costs with LE ROI'S New 52

America's Most Powerful

Get the Benefit of These Features

Greater Power—180 H.P. at the flywheel, 167 Belt Horsepower and 140 Drawbar Horsepower. Unmatched by any other crawler!

Higher Speed—The TD-24 is built for high speed operation as well as for tremendous pull.

"Planet-Power Steering" means greater drawbar pull on turns—power on both tracks! Also pivots easily!

Hydraulic "Finger-tip Control"—relieves operator of work in maneuvering this agile giant. Provides instant High-Low Range shift.

Quick Reverse Shift—bypasses speed change gears to permit instant forward-to-reverse and reverse-to-forward shift.

Synchromesh Transmission—permits shifting "On the Go"!

8 Speeds Forward and 8 Speeds Reverse—provides correct gear for each load condition.

THIS new, versatile giant of power and pull now rolls off the production line at International Harvester's mammoth Melrose Park Works. It is America's *most powerful* and *easiest to operate* crawler. It cannot be beat for work capacity!

See your International Industrial Power Distributor soon and get the whole story, including specifications and delivery data, on this new Diesel tractor. When you put the TD-24 to work on your jobs, watch your earth-moving costs drop.

Industrial Power Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue • Chicago 1, Illinois

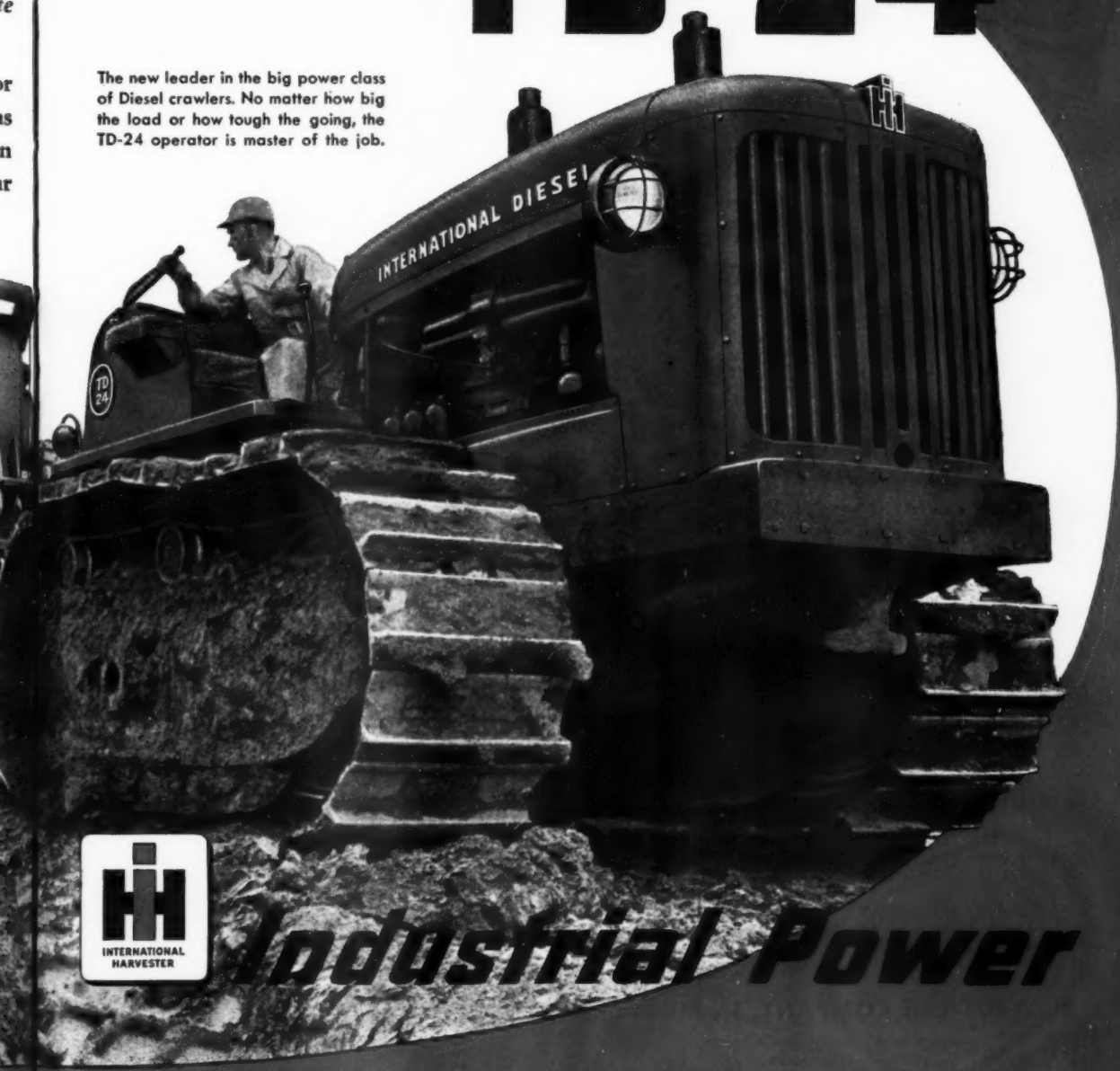
CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL

Crawler Tractor

The INTERNATIONAL TD-24

The new leader in the big power class of Diesel crawlers. No matter how big the load or how tough the going, the TD-24 operator is master of the job.



INTERNATIONAL HARVESTER

Industrial Power

Bucyrus-Erie Announces A Complete New Line of Tractor Equipment *for International TD-24 Tractors*

BULLDOZERS

Sturdily built, thoroughly field-tested with the tractor. Highly wear-resistant alloy steel blade, reinforced for hard digging, curved to keep dirt rolling. Reversible cutting edge. Box-section push arms, with vertical diagonal braces strongly welded to blade. Simple, effective cable control. Combination of castings and weldments for strength and durability. Easy to apply to the tractor.

BULLGRADERS

Unusual visibility for accuracy, efficiency and safety of control. Tilting and angling adjustments for increased versatility. Manganese steel blade of high tensile strength. Reversible cutting edge. Replaceable cast steel corner shoes. Loads and thrusts placed to make most efficient use of tractor power. Cable controlled, with large sheaves placed well out of the way of dirt . . . simple cable reeving.

SCRAPERS

Four-wheel scrapers of 13.5 and 22 cubic yards struck measure capacity. Low center of gravity and wide-spread rear wheels furnish outstanding stability. Exclusive double-curve cutting edge . . . loads more uniformly with less horsepower. Positive rolling ejection takes less power . . . permits dumping and spreading in higher gear. Hinged, two-part apron on 22-yard scraper provides exceptionally wide opening for handling sticky or bulky materials. Can also be used as conventional single-piece apron . . . changeover requires only a few minutes. Main frame sides protected from wear by alloy steel side cutters bolted to side frames. Cutters are reversible for longer life.

Power Control Winches

Front-mounted single drum winch for use with bullgrader or bulldozer blade. Rear-mounted double drum winch for blade and scraper combinations. Planetary drive . . . constant live power instantly available. Low hand lever loads — conveniently located controls. Cool-running . . . interchangeable bands . . . single adjustment takes up all planetary main bearings. Band adjustments are easy to make, long lasting. Cushioned action is easy on cable, tractor and equipment.

BUCYRUS-ERIE COMPANY, So. Milwaukee, Wisconsin

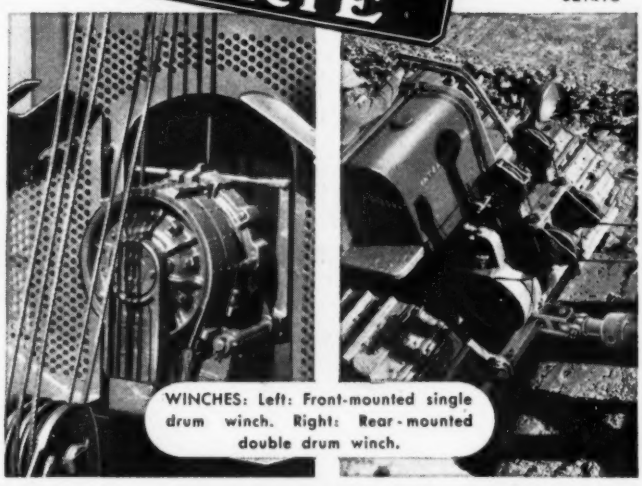
Scientifically curved Bullgrader blade keeps dirt on the move.

See Your INTERNATIONAL

te

L

The B-250 scraper has 22 cu. yds. struck capacity. Hinged apron provides greater opening.



WINCHES: Left: Front-mounted single drum winch. Right: Rear-mounted double drum winch.

INDUSTRIAL TRACTOR DISTRIBUTOR

Shots

(Continued from page 34)

were voted by members of the society of tunnel and heavy construction men "for outstanding contributions to construction progress."

In addition to his strictly military duties in his capacity of Chief of Engineers, Department of the Army, General Wheeler was cited for his work in directing a multi-million dollar program of civil works construction including river and harbor and flood control work, for construction of scores of hospitals for war veterans.

Railroad construction, involving a gamut of responsibilities that included chainman, rodman, instrumentman and chief of party, foreman, superintendent, resident engineer and contractor's estimator and district manager, provided the lower rungs in the career ladder which William Austin Durkin, a native of Indiana, climbed to reach the top executive post in one of the nation's leading contracting organizations—the presidency of the Walsh Construction Co. of New York City, Davenport, Ia., Chicago and San Francisco.

Among the scores of outstanding projects (other than railroad construction) built by the Walsh organization within the past 15 years are the $23,500,000 Queens-Midtown vehicular tunnel under the East River, New York City, four 33-ft. diameter diversion tunnels for the $125,000,000 Fort Peck Dam, world's largest earth fill, in Montana, the first section of Grand Coulee Dam, on the Columbia River, Washington (jointly with other contractors), tunnels and shafts for New York's Delaware River Aqueduct, three tunnels for Southern California's Colorado River Aqueduct, the Cresta hydro-electric tunnel for the Pacific Gas & Electric Co.

Recent wartime projects included: Camp Edwards on Cape Cod, Mass., for the Army, the U. S. Army base at Trinidad, two huge drydocks at the Brooklyn, N. Y. Navy Yard, and scores of cargo and escort vessels for the Navy built at a shipyard established at Providence, R. I., several hundred invasion barges at Jersey City and a Navy ammunition storage depot at Red Bank, N. J.

• Ruins of the U. S. Embassy in Berlin, Germany, are being cleared away by this ½-yd. Bucyrus-Erie 10-B shovel. It is thought that many embassy records may still be intact in the basement of the building, which was wrecked by allied bombing raids.

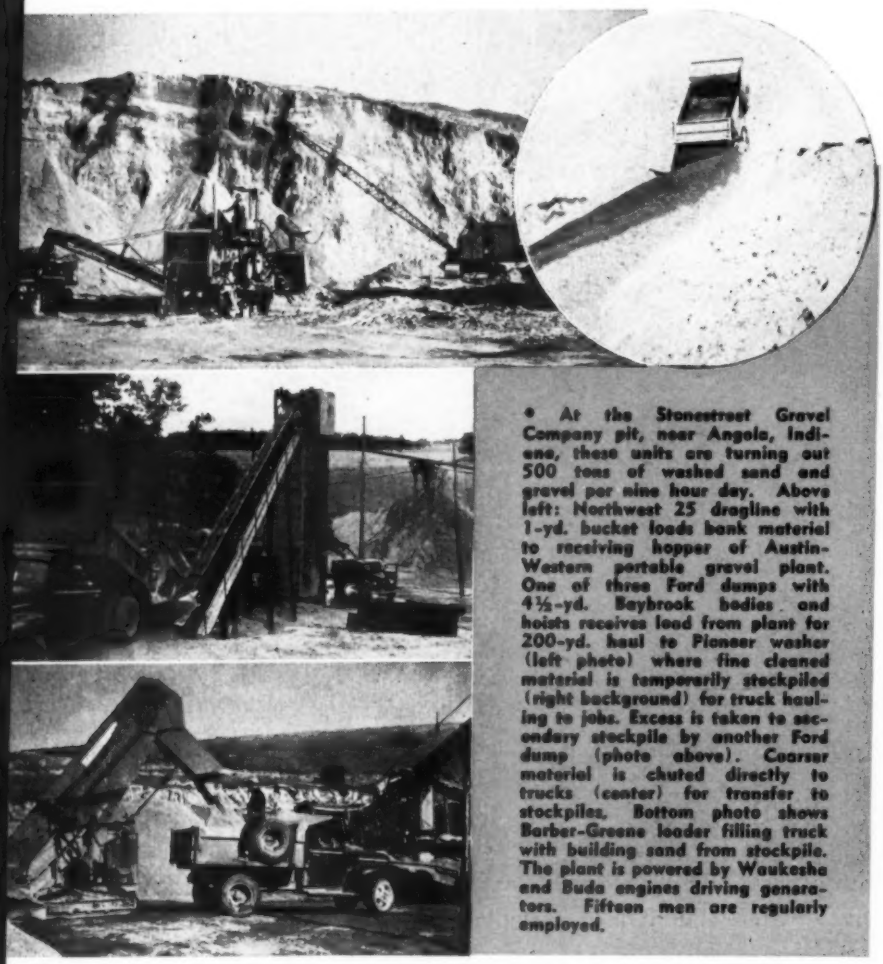
"Throwing Money Away" on Oklahoma Road Repairs

Oklahoma's next State Legislature will be confronted with the problem of providing additional funds for the State Highway Department if a construction program is to be carried out on the state's primary roads, it was indicated when the roads and highways committee of the State Legislative Council met last month with the highway commission to begin a study of proposed legislation dealing with Oklahoma roads and highways.

State Highway Director H. E. Bailey informed the committee that construction costs are up 50 to 60 per cent, and costs of some items in construction have increased 100 per cent since 1939.

Bailey said his department this year has completed a special maintenance program, mostly repair of bituminous roads, at a cost of $3 million, to put 953 miles in shape for traffic.

"It looks as if we are throwing away money to do some of the repair work," he said, "but if we don't do it you can't get over the roads. The highways are getting older each year and they are requiring more maintenance as traffic gets heavier. It would be a financial saving to taxpayers to replace the principal primary roads



• At the Stonestreet Gravel Company pit, near Angola, Indiana, these units are turning out 500 tons of washed sand and gravel per nine hour day. Above left: Northwest 25 dragline with 1-yd. bucket loads bank material to receiving hopper of Austin-Western portable gravel plant. One of three Ford dumps with 4½-yd. Baybrook bodies and hoists receives load from plant for 200-yd. haul to Pioneer washer (left photo) where fine cleaned material is temporarily stockpiled (right background) for truck hauling to jobs. Excess is taken to secondary stockpile by another Ford dump (photo above). Coarser material is chuted directly to trucks (center) for transfer to stockpiles. Bottom photo shows Barber-Greene loader filling truck with building sand from stockpile. The plant is powered by Waukesha and Buda engines driving generators. Fifteen men are regularly employed.

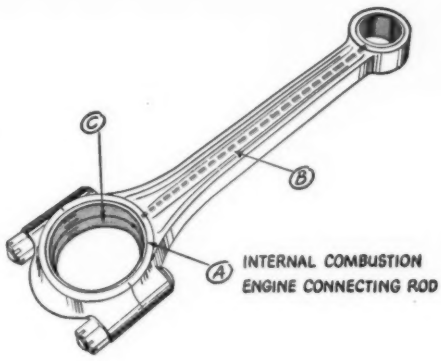
Chart "Ambitious" Penn. Public Works Program

"An ambitious" program of public improvements for Pennsylvania in 1948 was forecast by Gov. James H. Duff in a message to the 26th annual meeting. in Atlantic City, N. J., of Associated Pennsylvania Constructors.

Projects slated for 1948 in Pennsylvania were listed by Governor Duff as including the desilting of the Schuylkill River, highway consruction to relieve congestion in the Philadelphia and Pittsburgh areas, and extension of the Pennsylvania Turnpike to Paoli.

Pointing out that the state also has funds available to assist local govern-

CASE 1018--PROLONGING BEARING LIFE IN HEAVY-DUTY ENGINES.



INTERNAL COMBUSTION ENGINE CONNECTING ROD

In toughest operating conditions, specially compounded RPM Heavy Duty Motor Oil maintains lubricating film on bearings. For both gasoline and Diesel engines. Comes in five grades: SAE 10 to SAE 50.

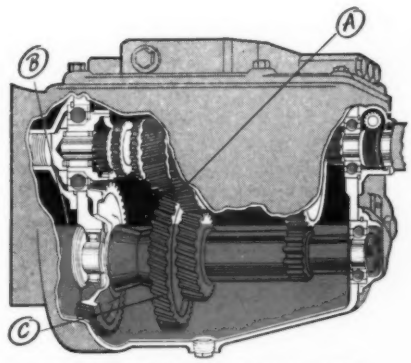
A. Contains anti-corrosion compound. Won't pit or honeycomb copper-lead, cadmium-silver or any other bearing metals.

B. Detergent keeps all oil passages and parts clean. Assures adequate supply of oil to all bearings, prevents ring-sticking and slow action of parts.

C. Adherence to metal surfaces, whether hot or cold, minimizes both running and starting wear. Film stays on idle parts and protects against rusting.

Other compounds in RPM Heavy Duty Motor Oil and natural qualities of selected base oils resist oxidation, formation of sludge and prevent foaming.

CASE 1029--REDUCING WEAR IN CONVENTIONAL AND WORM GEARS.



TYPICAL AUTOMOTIVE TRANSMISSION

Compounded RPM Gear Lubricant satisfactorily met all operating conditions in these gears in cars, trucks and similar machines. Comes in four grades: SAE 80, 90, 140 and 250. (For hypoids, use RPM Multi-Service Gear Lubricant.)

A. Compounds help resist high temperatures and pressures on gears. Minimize deposits and thickening. Make it non-corrosive to metals in gears and cases.

B. No foaming and leaking trouble - contains most effective foam inhibitor known.

C. High affinity for metal maintains lubricating film at all times. Constant oil wedge at gear contact points prevents scoring and extra wear.

RPM Gear Lubricant (Compounded) resists viscosity changes ... allows easy shifting in low temperatures and fast flow of lubricant onto gears.

For additional information and the name of your nearest Distributor, write

STANDARD OIL COMPANY OF CALIFORNIA

225 Bush Street, San Francisco 20, California

The California Oil Company
30 Rockefeller Plaza, New York 20, N. Y.

The California Company
17th and Stout Streets, Denver 1, Colo.

Standard Oil Company of Texas
El Paso, Texas

RPM CALOL

Trademarks Reg. U. S. Pat. Office

• This 200-ton roller is expected to save $1.5 million in time and building costs on the Baltimore Friendship airport. The "super-compactor," designed by O. J. Porter & Co., Sacramento, Calif., is said to give maximum compaction of soil to a depth of six feet, eliminate the necessity for extra rock layers under concrete, and detect soft spots which might otherwise cause settlement of the finished runway. Closeup at left shows the 20x7x6-ft. body of ¾-in. steel plates and 1-in. reinforcing on the sides. The four Goodyear tires are 30.00-33's, 60-ply, nearly a yard wide and eight feet high, and are capable of carrying up to 150 lbs. of air. Ballast seen at left consists of 80-lb. iron ingots. The $85,000 roller is drawn by a new 20-ton H-19 Allis-Chalmers tractor. A similar roller was recently shipped to Argentina for use on the new Buenos-Aires airport.

ment units in the construction of airports and landing strips, the governor said that 1948 should "see this airport program begin to take form, so that the commonwealth will have adequate facilities for airplanes in all centers of Pennsylvania."

See Acceleration of Pace

Millions of dollars worth of public improvements were delayed by the war, Governor Duff said, adding: "Pennsylvania has the funds appropriated to finance a large program. A start has been made in getting this work underway; the year 1948 should see the pace accelerated."

Pennsylvania Secretary of Highways Ray F. Smock said the State Highway Department alone will spend more than $100,000,000 on construction and repair during 1948.

"Pennsylvania and all other states," Smock declared, "must rebuild their state system to accommodate the present and future traffic requirements or acknowledge that they are satisfied with horse and buggy roadbeds to sustain modern designs of motor equipment."

Smock cited traffic surveys and field inspections showing that Pennsylvania should spend more than $160,000,000 a year for highways. Presenting a statistical analysis of revenue and expenditures, he asserted it was impossible to meet even the current program without increased income.

"The Highway Department is not promoting any increases in motor license fees or gasoline taxation," he said. "The actual facts are being presented. The motorists and taxpayers must decide to accept the responsibility as to whether they want adequate roads and are willing to pay for them, or continue with the present revenue and the prospect of an antiquated and obsolete highway system."

William A. Anderson, executive director of the Pennsylvania Aeronautics Commission, told the group that Pennsylvania is one of the leaders in airport construction under the federal airport act. He said the commission's plan is to develop a network of airports that will place all except the smallest communities within five miles of an airport facility capable of meeting that community's needs. "It is planned that this objective be accomplished in not more than 10 years," he said.

W. C. M. Butler of Hazleton was reelected president of the Associated Pennsylvania Constructors. Others named were Donald B. Stabler of Harrisburg, vice president; S. Howard Brown of Grantville, treasurer, and Herman Riebe of Lansford, chairman of the executive committee.

Use of Modern Equipment Reduces Highway Costs

by Dan R. Lamson
(ARBA Research Director)

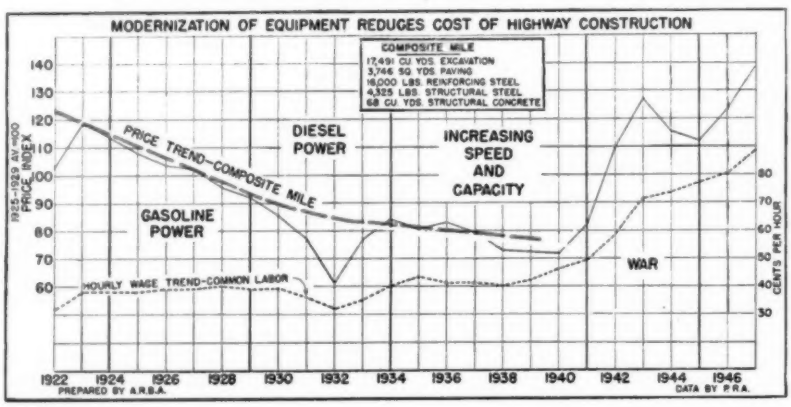
Labor expense and other factors have increased the construction and maintenance cost of highways to such a degree that for the funds available, a smaller mileage of highway construction and maintenance can now be obtained than during the prewar period. With these conditions existing, the best way to reduce the cost of the highway program is through the use of more efficient and economic construction equipment.

Changes in the design of road-building equipment have taken place so rapidly that their effect has not been given the recognition which it deserved. Since 1922, and until the nation's economy was upset by the war, there was a continuous downtrend in the cost of highway construction.

Gasoline Engine Starts Downtrend

First came the gasoline engine in the early twenties to replace horses and mules, causing a pronounced downtrend in unit prices on highway construction from 1922 to 1929. There was little fluctuation in labor rates during this period. The reduction in highway costs was entirely the result of the intro-

(Continued on page 46)


MODERNIZATION OF EQUIPMENT REDUCES COST OF HIGHWAY CONSTRUCTION
COMPOSITE MILE
17,491 CU YDS. EXCAVATION
3,746 SQ YDS PAVING
16,000 LBS. REINFORCING STEEL
4,325 LBS. STRUCTURAL STEEL
68 CU YDS. STRUCTURAL CONCRETE
PRICE TREND—COMPOSITE MILE
DIESEL POWER
INCREASING SPEED AND CAPACITY
GASOLINE POWER
WAR
HOURLY WAGE TREND—COMMON LABOR
1925-1929 AV.=100 PRICE INDEX
CENTS PER HOUR
1922 1924 1926 1928 1930 1932 1934 1936 1938 1940 1942 1944 1946
PREPARED BY A.R.B.A.
DATA BY F.H.A.

Power! Traction! Speed!

The new Allis-Chalmers HD-19 and Baker Bulldozer are setting remarkable records for low cost yardage on the toughest jobs in the nation.

With over 24 tons of fighting weight, this powerful bulldozing team provides speed, power and traction never before available.

ABOVE: Engine Mounted Hydraulic Bulldozer for HD-19
BELOW: Engine Mounted Cable Bulldozer for HD-19

Baker Bulldozers and Gradebuilders were designed from the blueprint stage up, to harness the terrific power of the HD-19. As a result you get every ounce of power at the blade — positive all weather traction for tough going — blade operating speeds that conform to travel speeds — fast, easy operating controls — good visibility, and a complete package of power, versatility and operating economy.

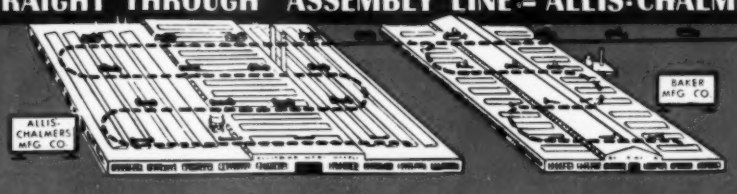
Before you start your next job — get started right. Send for literature today on the Baker Cable or Hydraulic Bulldozer and Gradebuilder.

BAKER MFG. CO., SPRINGFIELD, ILL.

BAKER

They Go Together

"STRAIGHT THROUGH" ASSEMBLY LINE – ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops, adjoins the Allis-Chalmers crawler tractor plant.

When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

WORLD'S LARGEST,

Keeps Big Loader Operating

HD-19 MORE THAN SUPPLIES POWER REQUIREMENTS OF EUCLID LOADER...SAVES 50 TO

On Terry & Steadman's Louisville Flood Wall job the new Allis-Chalmers HD-19 hydraulic torque converter tractor proved it has plenty of power to operate the big Euclid loader at capacity. Even though the ground was not scarified, the HD-19, unassisted, pulled the big machine as fast as the belt could handle the material.

And because of the torque converter, operator could start and stop tractor with throttle. Since 50 to 60 loads were obtained each hour, this many master clutch engagements were saved...obviously lengthening life of clutch. Torque converter also provided smooth, cushioned starts and stops—making it easier on tractor, loader...and operators!

MOST POWERFUL TRACTOR

at Capacity

60 CLUTCH ENGAGEMENTS PER HOUR

Whatever the job...pulling loaders or scrapers, or working with bulldozers...the powerful, smooth-operating, fast-working HD-19 will lower your costs, increase your profits.

Allis-Chalmers Torque Converter Tractor . . . **HD-19**

IT'S RUGGED AND TOUGH . . . BUILT TO OUTPRODUCE & OUTLAST!

Weight: **40,000 pounds.**

Power: **2-Cycle General Motors Diesel — 163 hp. at flywheel.**

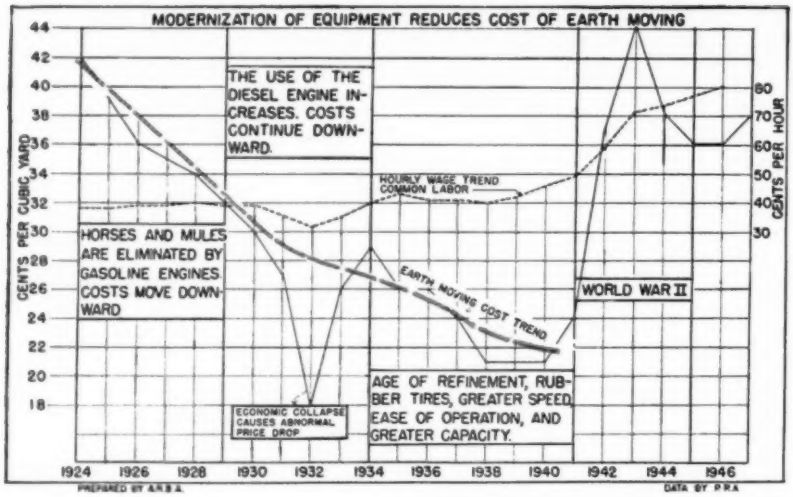
Speeds: **0 to 3 in low gear and 0 to 7 in high; reverse 0 to 5.5.**

Torque converter **automatically balances load and speed without gear shifting.**

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Originator of the Torque Converter Tractor


MODERNIZATION OF EQUIPMENT REDUCES COST OF EARTH MOVING
CENTS PER CUBIC YARD
COSTS PER HOUR
HORSES AND MULES ARE ELIMINATED BY GASOLINE ENGINES. COSTS MOVE DOWNWARD
THE USE OF THE DIESEL ENGINE INCREASES. COSTS CONTINUE DOWNWARD.
HOURLY WAGE TREND COMMON LABOR
EARTH MOVING COST TREND
WORLD WAR II
ECONOMIC COLLAPSE CAUSES ABNORMAL PRICE DROP
AGE OF REFINEMENT, RUBBER TIRES, GREATER SPEED, EASE OF OPERATION, AND GREATER CAPACITY.
1924 1926 1928 1930 1932 1934 1936 1938 1940 1942 1944 1946
PREPARED BY A.R.E.A.
DATA BY P.R.A.

Shots

(Continued from page 42)

duction of gasoline power and the changes in design made possible by it. The only variable was the efficiency of mechanical equipment.

The downtrend in costs continued with the introduction of the diesel engine, which made possible further changes and, during the following years, changeovers took place which included compressed air and hydraulic controls, the general use of rubber tires where possible, and higher speeds and greater capacity.

During the 18-year period of continuously decreasing highway costs, there was also continuous improvement in highway design. The heavy duty, high speed highway of today is hardly comparable to the highway of 1920. Even had the same highway demand been present at that time, earth moving for the deep cuts and high fills, similar to those now required, would have resulted in costs which would have been prohibitive using the equipment of that period.

Minimum Requirements Are Passed

Minimum requirements for earth moving are no longer in effect. Modern specifications call for minimum grades and long radius curves. Yet, despite these changes, costs continued downward during the mechanization period between the two wars.

In the years ahead, the importance of continued equipment modernization cannot be overestimated. The country is sorely in need of a huge highway construction program. The greater the reduction in costs, the greater will be the program, and the sooner it will get into full swing. The manufacturers have been successful in the past in reducing highway costs and, with the need more pressing, they can be depended on in the future.

Show Increased Efficiency

The chart showing the downtrend in cost of the composite mile of highway construction is an excellent example of the effects of increasing the mechanical efficiency of highway construction equipment. Had it not been for this long period of continuous improvement of equipment, costs would now be at a level which would bring road construction to a relative standstill.

Close cooperation between the manufacturer, the contractor and the engineer will speed up equipment modernization. The engineers are responsible for specifications and standards which the contractors follow in building the highway and for which the manufacturers furnish equipment. It is important at this time that they work together if costs are to come down.

An opportunity for all branches of the highway industry and profession to get together will be presented next summer. The 30-acre display of construction equipment and materials to be held July 16-24 at Soldier Field, Chicago, Illinois, will be the world's greatest road show of all time.

From the standpoint of the nation's economy alone, attendance should be a "must" for all highway engineers, contractors, manufacturers, distributors and others interested, directly or indirectly, in this country's highway transportation system. It will be a great opportunity to inspect and become thoroughly acquainted with the efficiency and economy of the latest equipment developments, which play a major part in reducing the costs of highway construction and maintenance.

Louisiana Sees Largest Program in Its History

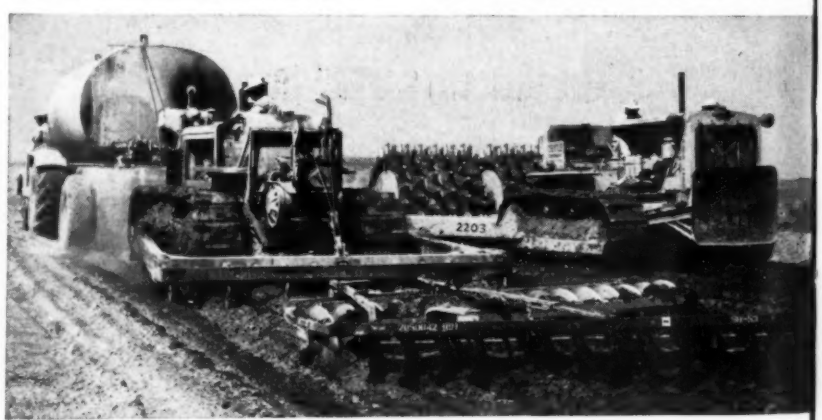
Plans for the expenditure of more than $37,000,000 on Louisiana highway improvements during 1948 were announced last month by State Highway Director J. L. V. Grenier, who pointed out that Louisiana now is "in the middle of the biggest highway program" in the state's history. Construction and maintenance in Louisiana during 1947 cost $23,056,000 Grenier reported, and the balance of the funds available for last year will be carried over for use in the future.

"The highway department made a creditable showing in 1947," he declared, "but we expect to do quite a bit better this year. Some materials and equipment are obtainable now that were in very short supply before, and we are looking forward to making even more of a showing now."

60% Is for New Construction

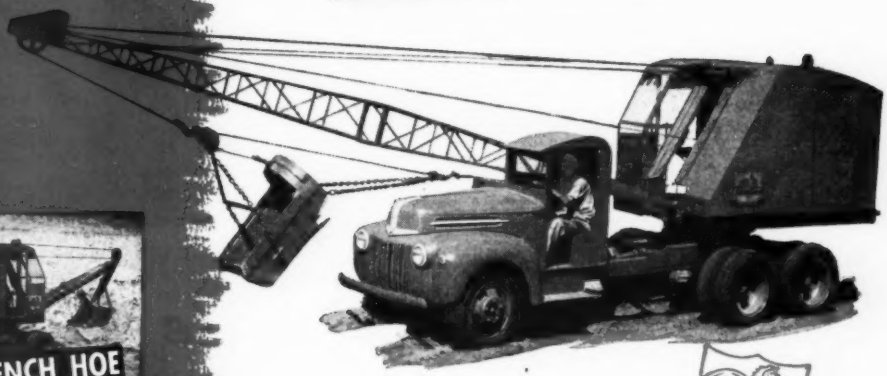
Grenier said that new construction scheduled for 1948 in Louisiana includes approximately 80 miles of concrete pavement, 165 miles of bituminous surfacing, 27 major bridge and overpass projects, and three scale installations. This work will represent almost $22,000,000, or about 60 per cent of the total annual expenditure, he added.

Maintenance of the present state highway system will amount to $11,000,000, and state aid to parishes will cost approximately $1,000,000 Grenier said. Highway planning and surveys, in

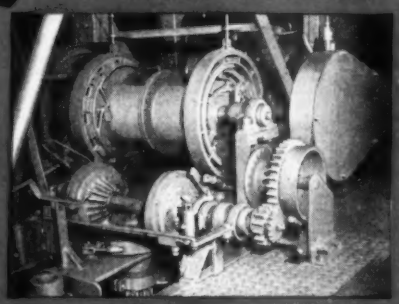


• Equipment working on the 3½-mile earth-fill Potholes Dam near Spokane includes this 4000-gal. water truck (converted from a DW-10 Caterpillar-drawn Insley trailer), a TD-18 International tractor with Held & McCoy scarifier and International 24-in. 2-way disc, and a Caterpillar D-8 pulling a Held & McCoy sheepsfoot roller. Joint contractors are C. F. Lytle Construction Co., Sioux City, Iowa; Green Construction Co., Des Moines, Iowa; and the Amis Construction Co., Oklahoma City, Okla.

VERSATILITY PLUS MOBILITY



The "HEART OF THE BANTAM"



The simplest machine made

- All major assemblies roll on ball bearings
- No strain on center pin
- Full circle design
- High strength alloy construction
- Simplified lubrication
- Easy maintenance

BANTAM

THE 1/3 YARD SCHIELD

PORTABLE DRAGLINE • CLAM • SHOVEL
TRENCH HOE • PILEDRIVER • CRANE

There's no limit to the everyday jobs for the Schield BANTAM or the time, labor, and money it can save. It travels the highway at truck speeds... drives up to the job and digs in. Mounts on any 1½ ton truck and goes wherever the truck will go. Unbeatable for versatility and economical performance in close quarters.

Its FAST CYCLE operation piles up yardage. *Ball bearings* on all major assemblies add to speed and ease of handling—keep maintenance costs low. Changing from dragline to clam, shovel, trench hoe, piledriver, or crane is a matter of minutes. Split-type laggings allow proper line speeds and guarantee profit-making performance on all operations.

Talk to any Schield BANTAM owner and learn the facts about its low cost, smooth operation, easy maintenance, and capacity for getting jobs done. Then see your dealer about delivery.

Your name and address on a Post Card will bring you illustrated literature. WRITE TODAY.

THE PERFECT TEAM-MATE
FOR YOUR LARGER EQUIPMENT

THE SCHIELD BANTAM CO., INC.
202 PARK STREET — WAVERLY, IOWA

conjunction with the federal government, will cost $715,000; equipment will cost about $500,000; administration will be less than $2,000,000, and other charges will amount to about $400,000.

Funds available to the Louisiana department for this program include a total of more than $28,000,000 in federal aid. This amount includes a balance of $6,785,348 of funds allotted prior to the federal highway act of 1944, and $21,541,447 in federal postwar allotments for the first three postwar years.

New Ky. Commissioner

Kentucky's new state commissioner of highways is Garrett L. Withers, an attorney of Dixon, appointed by Gov. Earle C. Clements to succeed J. Stephen Watkins.

A former member of Kentucky's old nine-member highway commission, Withers has served as Webster circuit clerk, county attorney, master commissioner, and as a federal referee in bankruptcy.

Road Show Committee

Harvey A. Scribner, President of Russell T. Gray, Inc., Chicago industrial advertising agency, has been appointed Chairman of the 1948 Road Show Promotion Committee by the American Road Builders' Association. The show will be held in Chicago on July 16-24, at Soldiers Field where road building and construction machinery manufacturers will exhibit equipment.

Mr. Scribner has appointed the following members to his committee: Norman W. Gregg, Washington, D. C., Public Relations Director, American Road Builders Association; Scranton Gillette, Chicago, Publisher of Roads and Streets; Gordon Anderson, Minneapolis, Publisher of Construction Bulletin and Secretary, Associated Construction Papers; Emory M. Heuston, Milwaukee, Publicity Manager, Bucyrus-Erie; Howard Kenyon, Milwaukee, Partner, Arnold Andrews advertising agency; Eugene Weyeneth, Peoria, Manager of Customer Relations, R. G. LeTourneau, Inc.; Hugo J. Masuhr, Supervisor of Industrial Advertising, Allis-Chalmers Mfg. Co.

Lease Fla. Ilmenite Lands

A long-term lease of ilmenite-bearing lands has been signed with the State of Florida by the Du Pont Company. This will provide a large domestic supply of the ore and will end the company's dependence upon foreign sources of it. Up to now, most of this raw material has been imported.

Lands leased by the company are located in the north central area of Florida and are owned by the State. Du Pont has detailed studies under way for the installation of equipment for large scale mining operations.

Ilmenite is the black ore from which white titanium pigments are manufactured by Du Pont at its plant in Baltimore, Md., and Edge Moor, Del.

"Americans Waking Up" to Need for Diversion Curb

By Charles M. Upham
Engineer-Director, ARBA

Gas tax diversion is on its way out. Billions paid by motorists for highway improvement since 1930 never reached our roads and streets because the dollars went elsewhere. Now Americans are waking up to the need of locking the door before more horses are stolen. The trend away from diversion is on.

Nineteen states have passed constitutional amendments which prohibit the spending of highway user taxes for purposes other than highways. Legislation to this end is pending in ten more states. This is a start, but until the Union is 100 per cent against diversion, highways will suffer.

The demand for a modern system of highways is greater than ever before in our history. The importance of safeguarding highway user funds for highway purposes was never more imperative. Every tax dollar must go for its intended use and for no other.

Reasons for Opposition

In this campaign against the misuse of highway funds which has hampered economic transportation, retarded road building, delayed the highway safety program and proved detrimental to the nation's economic welfare, it is well to review some of the reasons for

EXPERIENCE is The Best GUIDE!

Men who use shovels or similar types of heavy duty material handling equipment, need not be reminded of the important part that wire rope plays in determining their final production costs.

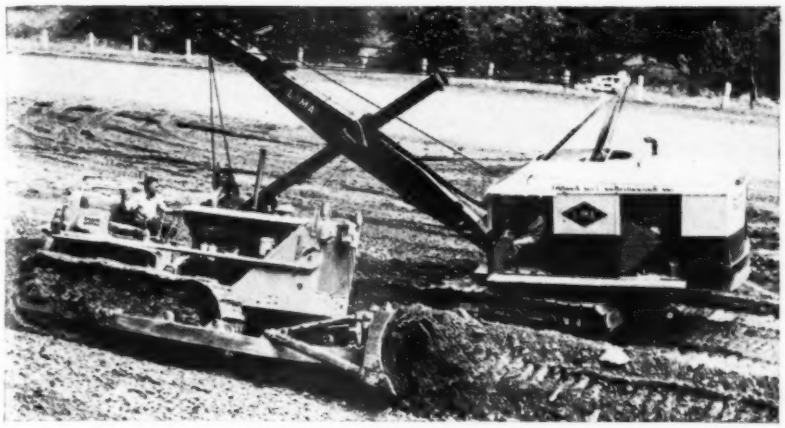
Experience has proved that the longer a rope lasts, the lower is its cost per unit of work done. Less time, too, is wasted in making replacements.

It is *also the experience* of a large number of Wire Rope users that they can depend on Preformed "HERCULES" (Red-Strand) Wire Rope for top-flight performance. Its toughness . . . its easy spooling . . . its unusual endurance—make for longer life, faster work, and lower operating cost.

Our Engineering Department will gladly submit detailed recommendations for any Wire Rope Job! Just ask us.

"HERCULES" (RED STRAND) the DEPENDABLE WIRE ROPE for any TOUGH JOB

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
ESTABLISHED 1857
3909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI
NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE



• Caterpillar D8 bulldozer gives final slope to a cut on N. Y. route 17 between Wellsville and Bolivar, pushing excess material to 2-yd. Lima shovel which loads to wagons not shown. The contractor is Parlor City Construction Co., Endicott, N. Y.

opposing diversion. Every citizen in those states where no constitutional amendment is in force should be familiar with them.

Diversion throws into the discard the principles upon which motor vehicle taxes are based. The gasoline tax is a special tax for a special purpose, a highway service—a road toll paid by motorists for the building and upkeep of the roads they use.

It is a tax based on sound principles, providing benefits for those paying the tax in proportion to the amount paid and from the source that has the ability to pay.

To divert any portion of this fund for any purpose other than the construction and maintenance of highways takes benefits from those who sponsored and are paying the tax that is justly theirs. Diversion places an unfair burden on motorists alone which should be borne by the public at large.

The gasoline tax, when used for purposes other than roads, is inequitable because it places a second tax for such purpose on the vehicle owner who has already paid general taxes. Gas tax diversion to purposes other than streets and highways encourages the habit with lawmakers to fall back on an unsuitable expedient at the expense of sound principles.

Diversion breaks faith with the motorist and becomes just another sales tax. Such diversion is an abuse of the most satisfactory and equitable method yet devised for financing highways. Continued road building supports the industries engaged in construction, in the production of materials and machinery, and sustains the automobile, truck, rubber and petroleum industries. Gas tax diversion means the interruption of this support.

The cause of safety demands that every dollar of gas tax funds be used for highway improvement.

Modern highway construction requires a fixed income. Emergency diversions of this income disrupts the highway organizations, causing waste, delay and inefficiency.

90% Goes to Labor

Diversion of gasoline tax funds breaks the backbone of highway revenue, reduces the highway program, retards the completion of the highways system, and increases unemployment. Approximately ninety cents of the highway dollar goes directly to labor in most of the nation's basic industries.

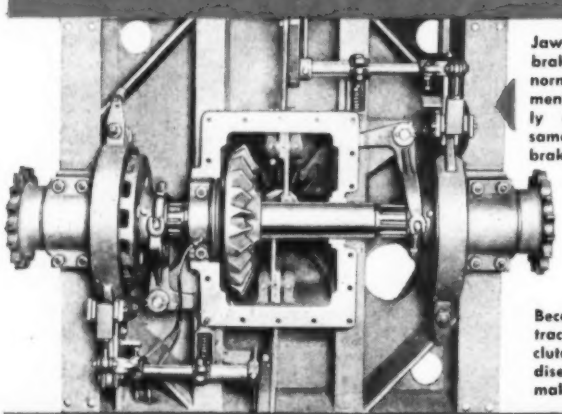
(Continued on page 52)

BIGGER PAYLOADS
with WELLMAN
Williams Type BUCKETS
• Exclusive features in design and construction make payloads bigger... at lower cost! Weight is balanced, not cumbersome. Extra strength is built into every part with the sturdy welded rolled steel construction pioneered by Wellman, the leader for over fifty years. A type for every service!
THE WELLMAN ENGINEERING COMPANY
7002 CENTRAL AVENUE • CLEVELAND 4, OHIO
SEND FOR BULLETIN

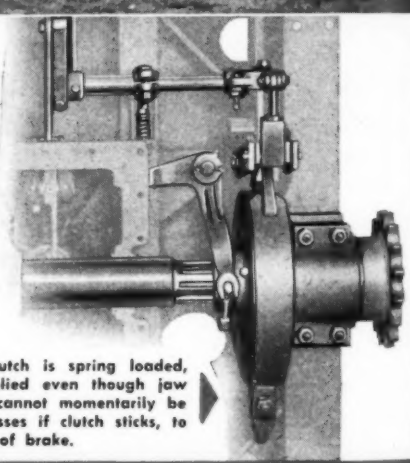
KOEHRING 205

HALF YARD

Works Safely on 30% Grade without Blocking



Jaw clutches and traction brakes work as a team. In normal operation, engagement of brake automatically disengages clutch for same crawler. Applying both brakes locks 205 securely for all operations.

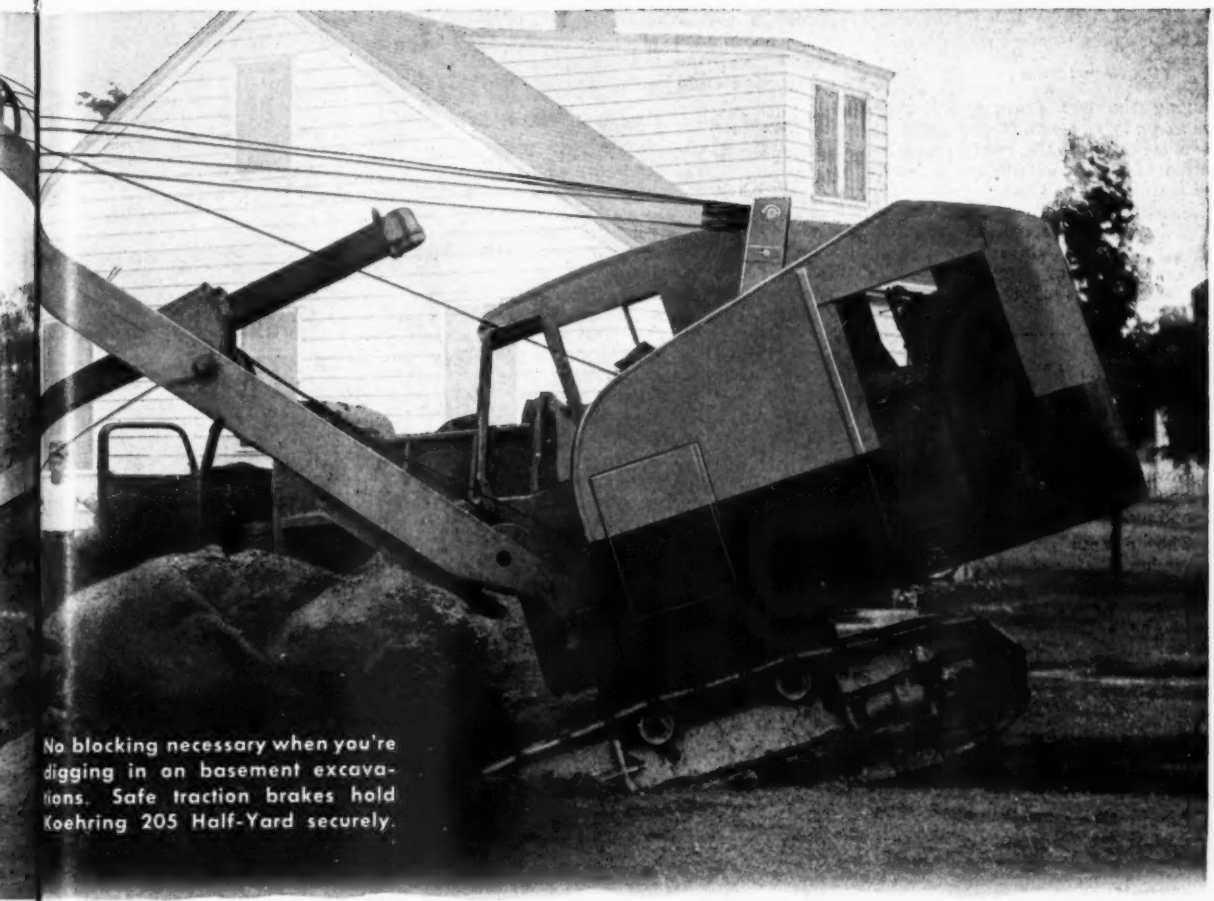


Because linkage to jaw clutch is spring loaded, traction brake can be applied even though jaw clutch is locked tight and cannot momentarily be disengaged. Spring compresses if clutch sticks, to make possible engagement of brake.

HERE'S ANOTHER KOEHRING UNIT THAT WILL SAVE TIME ON YOUR DIRT-MOVING JOBS . . . HEAVY-DUTY DUMPTOR

6-yard Koehring Dumptor has constant-mesh transmission, eliminates delay for shifting gears . . . has three fast forward and reverse speeds, can shuttle from shovel to dump, eliminates turning delays . . . has instantaneous gravity dump, saves 10 to 20 seconds in unloading time every cycle. They're engineered and built to haul tough materials over rough terrain and steep grades . . . are easy to operate . . . simple to maintain . . . will give you less down-time, more work-time. Ask your Koehring distributor for complete Dumptor facts TODAY.

DUMPTOR — Trade Mark Reg. U. S. Pat. Off.



No blocking necessary when you're digging in on basement excavations. Safe traction brakes hold Koehring 205 Half-Yard securely.

Saves Time on Every Job

You can work safely on a 30% grade without blocking crawlers on the Koehring 205 Half-Yard. Crawlers are held by big friction brakes, not by a pawl or jaw lock. These friction brakes provide the flexibility that's necessary to cushion brake assembly against operating shocks. That's why there's no danger of brake damage on the 205. Without blocking you will save time on any job.

Here are other advantages of the Koehring 205 Half-Yard brake and steering system:

Traction brakes can be applied at any time, on any grade. Safety spring in operating linkage lets you apply traction brakes even when traction jaw clutches are locked and cannot be disengaged. Your 205 will never run away from you on the grade.

- By applying power to one crawler, and brake to the other, you can turn in a tight circle, within 205's own length.
- Easy to make wide turns under accurate control.
- Operator never leaves cab to apply traction brakes or to steer. Separate levers in cab control friction brake as well as jaw clutch for independent operation on each crawler.
- Full steering and brake control is available with cab in any position.

Your Koehring distributor can show you many other ways this versatile Half-Yard can save time, money and increase production on your excavating jobs. Ask him, too, for facts and figures on the larger Koehring 304 and 605 excavators.

KOEHRING COMPANY
Milwaukee 10, Wisconsin
Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

Shots

(Continued from page 49)

During the war years many highways and city streets suffered materially because of unusually heavy loads, relaxation of normal controls and diminished maintenance. Consequently much of the country is faced with a worn-out and antiquated system of roads. Congestion, confusion, delays, accidents result because we are trying to make roads and streets of the prewar era meet the monumental transportation problems of today and tomorrow.

Sober consideration of the highway needs of the present and the future, from the standpoints of pleasure, safety and commerce, is sure to emphasize the urgent need that every cent of the motorist's dollar should go for the purpose for which he pays it.

Diversion is indefensible. The indictment against it is too strong. As a menace to our highways' welfare it should be vigorously opposed by everyone who must depend on roads and streets, and that means every man, woman and child in the land.

When Ohio adopted an anti-diversion amendment to the state's Constitution at last month's election, it became the twentieth state to forbid use of highway-user tax receipts for purposes other than highway spending.

The diversion which such amendments forbid has cost the nation's road systems some 2½ billion dollars since 1925, funds which could have made the difference between an adequate and an inadequate highway system in many states, according to the National Highway Users Conference. Even last year more than $100 million was diverted in the states without amendments, Federal figures show.

On a national basis, diversion last year took six cents of every highway tax dollar collected, according to figures of the Public Roads Administration.

Blaw-Knox to Supply Forms For Bull Shoals Dam, Ark.

Blaw-Knox Company has received a contract for all the steel forms to be used in construction of the Bull Shoals Dam, Army Engineers' project on the White River in Arkansas.

To cost an estimated $47 million, the Bull Shoals Dam will impound waters for flood control and feed an electric power plant. About 2,500,000 cu. yds. of concrete will be used, with pouring to begin in September 1948. The dam will be 2,256 ft. long and have a height of 280 ft. from bedrock to the roadway that will traverse it.

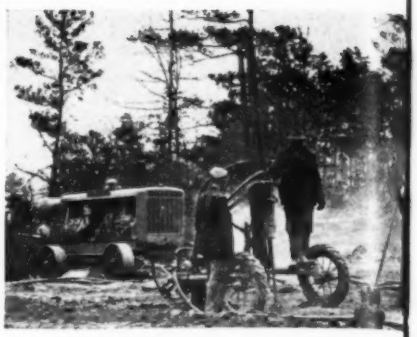
The steel forms are of an unusual type, a new cantilever design developed by Blaw-Knox during the past two years. This type form is not supported by tie rods but is anchored in the block of concrete previously poured. This eliminates 60 to 75 per cent of the anchors normally used. Nearly two million square feet of dam surface will be serviced by the cantilever pouring forms.

Bull Shoals Dam is to be built by Ozark Dam Constructors, an organization made up of nine contractors in a joint effort: Morrison-Knudsen Co., Inc., Boise, Idaho; Brown & Root, Inc., Houston, Texas; Wunderlich Contracting Co., Inc., Jefferson City, Mo.; Peter Kiewit Sons Co., Omaha, Nebraska; J. C. Maguire & Co., Los Angeles, California; Winston Brothers Co., Minneapolis, Minnesota; David G. Gordon; Condon Cunningham Co., Omaha, Nebraska; and Chas. H. Tomkins Co., Washington, D. C.

Speed Oklahoma Program Despite Rising Costs

Oklahoma's State Legislative Council, at a quarterly meeting held at the Okmulgee branch of Oklahoma A & M College, went on record for the State Highway Commission to proceed with highway construction as rapidly as possible despite inflated costs.

• 16-yd. Dixson 250 bottom dump wagon spills a load of zone 1 material on the 10,000-ft. South Dam (Columbia Basin Project in Washington) now under construction. The 450-ft. wide by 65-ft. high earth and rock-fill structure is being built by Roy L. Bair and James Crick & Sons, Spokane, under a $2.7 million contract.



• Garner-Denver UM-99 wagon drill puts down 1½-in. hole through rock overburden in the strip mine of Ross Coal Co., South of Tusselville, Ala. The compressor is a Garner-Denver WHB-365-D.

James A. Rinehart, chairman of the council's roads and highways committee, said the commission program, including the first, second and third projects of preference in each county, calls for expenditures of $335,000,000. The No. 1 project in each county, he said, will cost in excess of $77,000,000.

"The present capacity of the department is to carry on a construction program of about $25,000,000 a year," he added. "You can see how long it will take to get to the No. 1 project in each county." Rinehart's committee also recommended to the council that diversion of highway-user taxes from highway construction be terminated by the next session of the Oklahoma Legislature.

Point to Cost Increases

Data received by State Highway Director H. E. Bailey from the U. S. Public Roads Administration reveal several notable increases that account for higher highway construction costs in Oklahoma and elsewhere.

Taking the nation as a whole, PRA says that for the third quarter of 1947 common excavation averaged 40 cents a cubic yard or an increase of 16 cents over the same period of 1946.

Cost of reinforcing steel rose from $0.075 cents a pound to $0.093 cents, while structural concrete costs rose from $38.79 a cubic yard to $46.14.

Since July of 1946 freight rates have increased 47 per cent above prewar and the carriers have an application pending before the Interstate Commerce Commission for another hike.

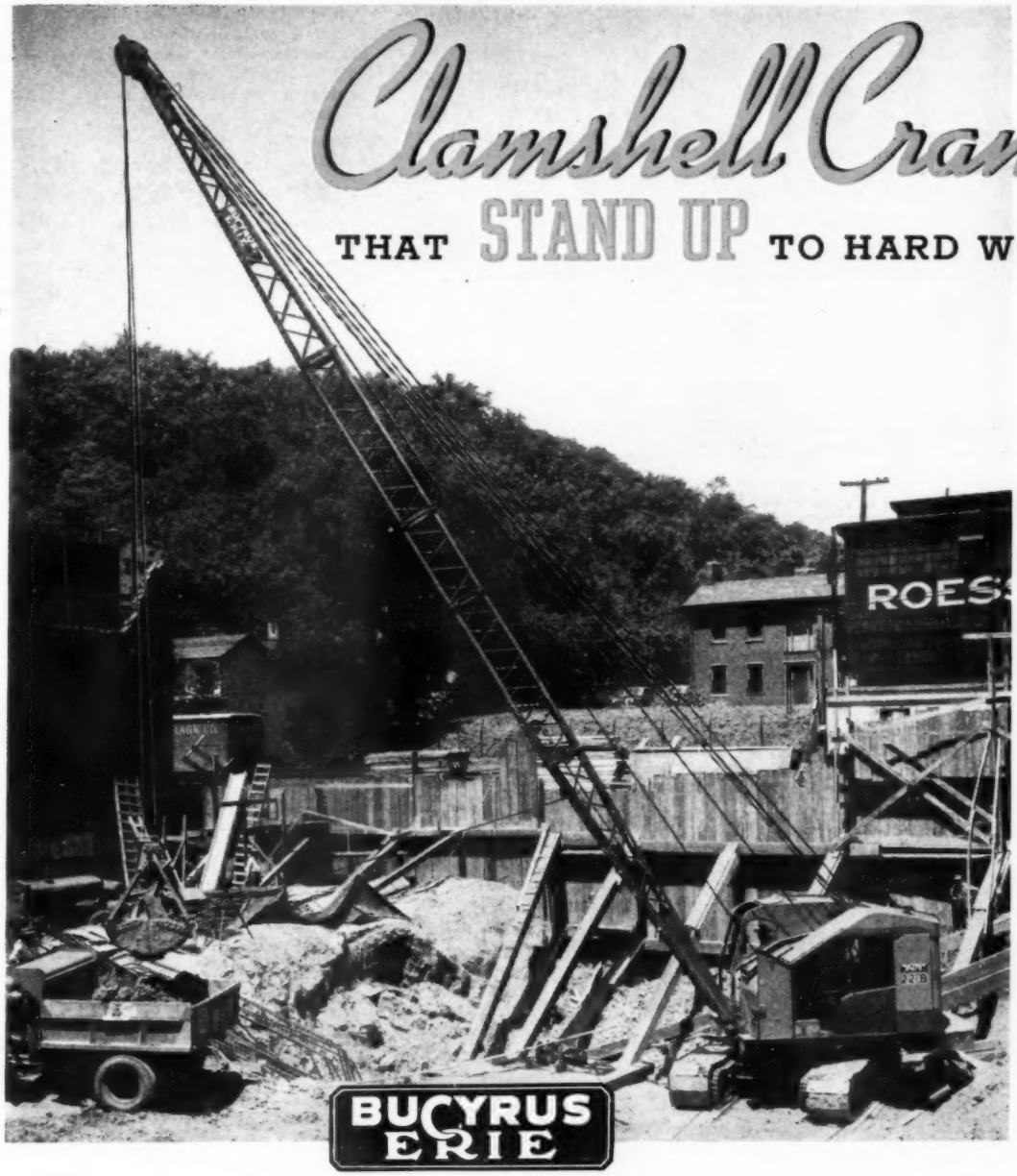
$43 Million Va. Program

The Virginia Department of Highways during 1947 put underway 60 major road improvement projects on its primary system of highways at a total contract cost of $18,650,000. An additional $4,000,000 in State force account work covered 50 smaller projects.

A year-end round-up disclosed that work totaling $14,748,962 was completed during 1947 and that a total of $22,502,116 in road projects was still

Clamshell Cranes

THAT STAND UP TO HARD WORK



THE SAME stability and ease of operation that make the Bucyrus-Erie ⅜- to 2½-cu. yd. machines such standouts as lifting cranes and draglines give them a high degree of efficiency in clamshell work.

Their stability is attained by efficient distribution of weight for a low center of gravity, plus sure-footed mountings with large heat-treated steel treads which carry them safely and surely over soft or loose ground and uneven terrain. Big, simple, durable clutches and brakes, responding smoothly to conveniently placed controls, enable the operator to maintain a fast-paced cycle — to hoist, swing and dump with a quick sureness that effectively boosts output. A strong, latticed box section boom of all-welded construction stands up under swing and compression stresses, can handle big loads.

Outstanding clamshell performance is only one of the services you can expect from Bucyrus-Eries. Each machine in the ⅜- to 2½-cu. yd. line is readily convertible in the field to various front ends and produces high-quality results with any type. Let your Bucyrus-Erie distributor show you how these famous machines can build profits for you.

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SOUTH MILWAUKEE, WISCONSIN

underway and would be carried over into 1948.

Completions during 1947 included 40.696 miles of four-lane highway, 141.190 miles of two-lane highway, and 37.598 miles of bituminous surfaced soil or gravel highway. Thirty-six bridges were completed on the primary system during the year.

The New Year promised to see a continuation of the Old Dominion's intensive road modernization program. Around $20,000,000 will be available for construction on the 9,000-mile primary system and $23,000,000 will go for maintenance and construction on the 38,000-mile secondary system. The State is charged with the administration of both systems.

Propose Colo. Toll Road

Colorado State Highway Engineer Mark U. Watrous announced last month that a survey to determine the economic feasibility of constructing a $3,000,000 toll superhighway between Denver and Boulder would be undertaken immediately by the engineering firm of Howard, Needles, Tammen & Bergendoff of Kansas City and New York City.

If the engineers deem the toll road economically feasible, actual construction probably will begin this year, Watrous said. Representatives of the engineering firm, which will be paid $6,000 for the survey, said they expected to complete their report within 60 days.

KEEPING ABREAST OF POWER PROGRESS . . . . . .

The new TOURNADOZER is protected against dust by a

DONALDSON AIR CLEANER

Dust and 'dozers go together, which makes dust protection for the prime mover essential. On the new Tournadozers, as on most heavy-duty equipment, Donaldson Air Cleaners are given the job of providing dust-free air for the engine, in this case a Buda 6DCS-844.

New power-driven equipment such as the Tournadozer presents new dust protection problems. Donaldson research, engineering and testing facilities are at the disposal of all manufacturers in solving these problems.

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Florida Will Spend $35 Million on Roads in 1948

About $35,000,000 will be available in federal and state funds for road and bridge improvements in Florida during this year, it was estimated last month by Chairman Elgin Bayless of the Florida State Road Board. He pointed out, however, that most of the funds will be required to improve and maintain the present system and to undertake specifically approved new construction on a state-federal fund matching basis.

Florida now has 8,750 miles of state-maintained roads and bridges, built at a cost of half a billion dollars in federal, state and county funds, according to the State Road Department's research and survey division, which reported that 8,394 miles of the state-maintained roads are paved, including 972 miles of city streets.

1947 Was Biggest Year

Last year was the biggest in the department's 32-year history, with $32,310,000 being spent on construction projects and $4,080,000 for regular and routine maintenance. In addition, contracts were awarded for about $18,000,000 worth of work that will be completed and paid for this year.

In years prior to 1947, $234,816,589 of state funds, $58,217,438 in federal money and $138,031,040 in county funds were spent on the present state-maintained system.

In addition to its state-maintained roads, Florida also has 29,900 miles of county roads and 9,900 miles of city streets — an overall total of 48,550 miles. Approximately 80 per cent of the county roads have been designated by the State Legislature as state roads, but they are still being maintained by the respective counties.

State Road Debts Reach New Low: PRA Survey

Last year witnessed a further reduction in highway indebtedness for practically all states in the country and brought the total amount of outstanding state obligations for highways to the lowest point in 17 years. This is one of the significant features revealed by a study of data recently issued by the Public Roads Administration.

The retirement of $50,875,844 in state highway bonds during the 1946 calendar year left $1,358,838,267 outstanding at the end of the year. In other words total state highway debt as of that date had been reduced approximately one-third from the peak level of over $2,000,000, reached in the late 30's.

Because of additions totaling more than $4,500,000 to sinking funds for bond retirement the net decrease in in-

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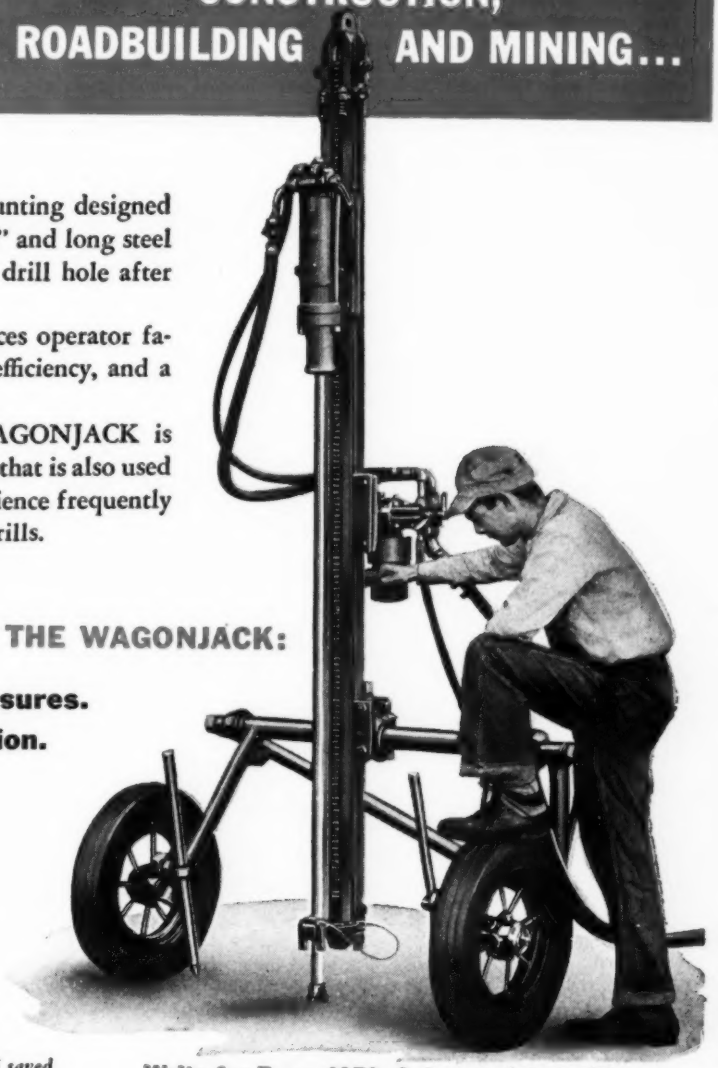
Here is a new Light Wagon Mounting designed to take full advantage of "Carset Jackbits" and long steel changes. With this combination you can drill hole after hole with one bit.

The *elimination of hand holding* reduces operator fatigue and insures greater footage, high efficiency, and a big reduction in drilling costs.

A REAL *one-man mounting,* the WAGONJACK is equipped with an air-operated feed motor that is also used for raising and lowering the frame. Experience frequently shows double the footage of hand-held drills.



YOU GET ALL OF THIS WITH THE WAGONJACK:

- **Uniform, positive feeding pressures.**
- **Large savings in air consumption.**
- **Long steel changes.**
- **Powerful steel puller.**
- **Easy, all-angle drilling.**
- **Time-saving steel centralizer.**
- **Powered frame elevator.**

CARSET JACKBITS saved one shaft contractor 18 man-hours per foot of shaft.

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debtedness during 1946 was actually $55,438,500. When this amount is combined with the decreases which were effected in overall state highway bonded indebtedness during previous years, the record shows that the net reduction in the period between our entry into World War II and the close of the calendar year 1946 approached one-half billion dollars.

As might be expected, the amount of highway bonds retired in 1946 represented a slower rate of debt reduction than during recent war years when other highway department expenditures were necessarily curtailed. Considering the fact, however, that with the exception of only three other years state highway construction and maintenance expenditures were at peak levels in 1946, the amount of highway debt reduction which the states were able to accomplish compares favorably with the average annual decrease of a little over $90 million during the 1941-1945 period.

As of December 31, 1946, the following nine states had no state highway debt: Arizona, Idaho, Indiana, Nebraska, Nevada, North Dakota, Oklahoma, South Dakota, and Utah. In addition, this type of debt in three other states, Georgia, Michigan, and Virginia, was entirely covered by sinking fund balances. Kentucky had only $298,000 of toll bridge bonds outstanding. It can be seen, therefore, that one-fourth of all the states were carrying no bonded indebtedness for highway purposes at the end of last year.

Still another factor which has tended to lessen the burden of highway debt in recent years has been the ability of the states to issue bonds at lower interest rates, thus permitting not only a saving on original issues but also enabling some states to reduce debt service requirements by means of refunding operations. Also, because of the sharp rise in state highway user tax revenues due principally to increased gasoline consumption since the end of the war, debt charges currently do not take as large a proportion of total state highway income as previously.

In some states, however, the percentage of highway user taxes allocated to payment of principal and interest on highway bonds is still large. For example, over 40 per cent of such tax revenues was allotted to this purpose in West Virginia last year, while Arkansas and Missouri had to set aside approximately 39 per cent and 31 per cent, respectively. Debt service requirements were also relatively large in such states as Iowa and Louisiana where about one out of every four dollars in highway tax revenues was used for payment of principal and interest on road debt. For the country as a whole, the lower burden of highway debt service in 1946 is shown by the fact that it was necessary to allocate only 8 per cent of total automotive tax revenues for debt service, as compared with 11 per cent in 1945 and in 1941.

—Courtesy Tax Economics Bulletin

• ½-yd. Wayne Crane shovel loads to Ford truck for Lynch, Pugh Corson Company on a Morgantown, W. Va., housing project.

• ¾-yd. Bucyrus-Erie 22-B dragline aids in removing an old bridge on Route 39, west of Dover, Ohio, for owner Wendling Brothers Company.

Plan Vehicle-Highway Study in Pennsylvania

The Highway Research Board has announced plans for an early study of the operation of heavy motor vehicles on highways traversing the mountainous section of southwestern Pennsylvania. The proposed series of tests, referred to as the Pilot Study, is designed to establish the performance characteristics of various types of heavy trucks and combinations. The study constitutes the initial phase of a planned research program of the Board's Committee on Economics of Motor Vehicle Size and Weight in the Department of Economics, Finance and Administration.

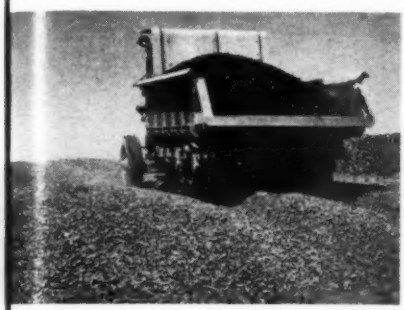
In its several phases, the planned research program of the Committee is designed to establish the ultimate economy of highway transportation, considering both the cost of heavy motor vehicle operation and the cost of road provisions at design standards and capacities necessary to accommodate the various levels of size and weight under investigation.

The test vehicles selected for the first phase of the investigation, the Pilot Study, consist of two trucks, three truck-tractor, semi-trailer combina-

tions, a truck and full trailer combination and a double combination of truck-tractor, semi-trailer and trailer. The several vehicles will provide a progressive number of heavy load axles ranging from one in the smallest single truck to six in the largest combination.

Each of the test vehicles will be variously loaded and operated with a series of uniform axle loads having 14,000, 18,000 and 22,000 pounds on the load axles to encompass the range of axle loads presently permitted in the various states. The carefully controlled conditions of axle loading, to be obtained by the use of precast-concrete blocks, will provide a range of gross vehicle weights extending from 20,000 to 142,000 pounds.

The routes selected for the operation of the test vehicles, scheduled to begin late this spring, are the Pennsylvania Turnpike and U. S. 30 and 11, through Chambersburg, having common termini



• This 8-cu. yd. Linn Half-Track with Commercial Hydraulic hoist is being used by H. F. Green Company, Spokane, to stockpile processed gravel near Adrian, Washington. The half-track treads are reported to give the truck excellent traction without crushing the gravel. Green's $373,612 contract is for stockpiling 170,000 yds. of sand and 295,000 yds. of coarse aggregates to be used for concrete structures in the Stratford-Adrian Soap Lake area of the Columbia Basin Project.

at Middlesex and Irwin. At least three round trips will be made by each test vehicle over each route, profile maps of which have been prepared to permit of recording operation variables on sections characterized by significant changes in gradient and curvature. The considerable contrast in the lengths and per cents of gradient on the two routes and in the two directions will provide a variety of operating conditions affecting heavy vehicle performance.

Will Use 7-Mile Long Conveyor at Bull Shoals

A contract to build a seven-mile long installation of conveyor belts — biggest postwar belt application and second longest ever constructed — has been awarded Goodyear Tire & Rubber Co.'s mechanical goods division. The conveyor system will haul raw materials for building the $58,000,000 Bull Shoals Dam on the White River in Marion and Baxter counties, Arkansas, 100 miles north of Little Rock.

A multi-purpose project, the Bull Shoals Dam was authorized by government engineers to provide power, flood control and irrigation facilities. Concrete placing is due to start in midsummer, requiring nearly three years to finish. Prime contractor is the Ozark Constructors.

Sixteen belt flights will comprise the cross-country transport system. Thirty-inch wide belts will be used for hauling a grand total of four million tons of crushed stone and sand to the damsite. Each belt flight will be powered by a 100 h.p. motor, and the system will be geared to move 525 feet a minute, delivering 650 tons aggregate per hour for the Flippin Material Co.

Second Longest Ever Built

The belt conveyor system will be the second longest ever built. Longest was the 10-mile run at Shasta Dam, California, started in 1939, which used 26 flights of Goodyear belts.

At Bull Shoals the quarry is seven miles from the damsite — requiring 14 miles of conveyor belting, including the return run. Blasted rock will be loaded by 3½-yard shovels and hauled in 12-yard Euclid dump trucks to the primary crusher. Here the stone, crushed to eight-inch maximum size, will be loaded on the belt for an overland ride to the damsite for final reduction and classification.

First half of the belt route is fairly level and the rest hilly, crossing several streams. The conveyor system will be erected on wooden bents, using native timber, varying in height above the ground from four to 20 feet. Two valleys will be spanned by means of 80-foot long suspension bridges.

The belt run will require 9,000 steel troughing idlers and 3,600 return rolls, and dumping from one belt to another at the 16 transfer points will employ the use of pneumatic cushioning idlers.

Road Work Must Keep Pace With Gas Usage, Up 11%

Motorists used 11.2 per cent more gasoline during the first six months of 1947 than during the corresponding period last year, Charles M. Upham, engineer-director, American Road Builders' Association, pointed out in a recent highway conference. "With vehicle mileage reaching astronomical figures, the highway construction program must keep pace to furnish safe and easier transportation for increasing number of drivers."

In 1946, more than 25 billion gallons of gasoline were consumed, and the nation piled up 340 billion vehicle-miles. Motor vehicle registrations this year will reach an all-time high of 37,164,000, surpasing last year's registrations by more than 3,218,000, and exceeding registrations in 1941, the pre-war motor peak year, by some 2,690,000, according to Public Roads Administration reports.

Many Roads Obsolete

"With highway travel reaching new highs, highway construction must move

• Removing broken rock at the start of full-heading operations at Bacon Tunnel is this Conway mucking machine. Contractor T. E. Connolly had previously driven 13x19-ft. pilot bores from both inlet and outlet portals for a total distance of more than 6000 ft. The 10,000-ft. tunnel, which will serve as part of the Main Canal for the Bureau of Reclamation Columbia Basin Project in Eastern Washington, will have a rough diameter of 27 ft. and a finished diameter (when lined with concrete) of 23 ft. 3 in.

• Removing sand and gravel from a back pool in the White River southwest of Indianapolis (left background) is American Aggregates Company's 10-in. Amsco-pump-equipped dredge.

into high gear for the convenience and safety of the public," said Mr. Upham. He pointed out that thousands of miles of inadequate highways menace the nation's drivers, and add to the problem of highway congestion. "Roads are obsolete in design, inadequate in width, alignment, grade, and sight distances. Reconstruction of congested and hazardous roads carrying large traffic volumes to modern standards cannot be deferred."

"Today's traffic demands that we build our highways to adequate standards just as rapidly as possible. Motorists can't wait 20 or 30 years for improvements needed today. Deferring road construction means further depreciation of the highway system which will add to construction cost at a later date. With the nation depending more and more upon highway transportation, the need for better highways is a pressing one. It will become more crucial long before the automobile industry can satisfy the demand for motor vehicles," Mr. Upham concluded.

Huge Watauga Dam Blasts

by F. N. Hollinsworth

Some two hundred million years ago, in what geologists call the paleozoic age, the Appalachian region of the eastern United States underwent a tremendous upheaval, leaving a fault in the mountains. This the Tennessee Valley Authority's engineers are now using to their advantage in construction of the Authority's Watauga Dam, six miles east of Elizabethton, Tenn. in the Iron Mountain Fault. West of the Fault — which is approximately 50 feet thick — lies an extremely hard quartzite, and to the east a softer dolomite.

TVA engineers knew that the fault ran directly through the site they had selected for the latest and 27th flood control and hydro-electric power dam, and now find it is a tremendous help in their work. Quartzite is about the hardest rock obtainable there, says George K. Leonard, project manager of the earth and rock-fill dam. It proved harder than the steel drills first used in an attempt to quarry the material.

With the know-how of fourteen years building other dams for the Authority, the engineers knew what to do, after drilling for dynamite charges proved unfeasable. They decided to bore a network of tunnels under each hillside and then blow it up as a unit.

In one such operation, 315,000 lbs. of high explosives secured 400,000 cu. yds. of rock to use on the dam. Dolomite, the softer strain of rock is crushed for cement to make the tunnels that will divert water from the Watauga River, to supply two 25,000-kw turbine generators to be installed at the dam.

The dam structure, to cost $29.5 million, will rise to a height of 320 ft. in a twisting gorge of the Watauga River. It will have a 1300-ft. base of rock and earth. An 800-ft. core of earth will be surrounded by thick layers of the quartzite. From its 1300-ft. base the dam will taper to 32 ft. at the top, backing up the Watauga about 18-miles and forming a lake covering 567,000 acre-feet of water. It will eliminate such flash floods as occurred in 1940, when several persons were drowned and extensive property damage done in Elizabethton, a city of 16,000.

• Sorry! The text used in connection with this photo in the Field Notes section of our October issue (page 616) indicated this was an "improvised trailer." We have been informed that this Gerosa Haulage Corporation-owned rig is actually a standard Rogers girder-type trailer. Our apologies to Rogers Brothers Corporation, manufacturers of trailers of this type (with unusually low bed for moving heavy equipment such as the Marion crane shown) for many years.

Better to Lift Than Push Snow, German Report Shows

According to tests conducted by the German engineer, Karl Croce, who was in charge of snow research for the

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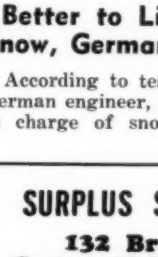

Popular Size Model No. 1004

The harder the pull, the tighter the arms hug the work. Made of heavy one-piece forged steel yoke. Heat treated forged steel arms and straps.

Will take gears, wheels, etc., up to 18" in diameter.

Diameter	18"
Reach	15½"
Diameter, Screw	1¼"
Length, Screw	16"
Hole adjustment	3 hole
Weight	40 lbs.

Bargain Price $22 ea. F.O.B South Milwaukee

Bucyrus-Erie Co.
South Milwaukee, Wis.

German State Highway System until 1945, about 50 percent of the work input in snow plows is lost in compacting the snow according to a British report now on sale by the Office of Technical Services, Department of Commerce.

Comprehensive tests conducted by Croce show that in clearing a wide road of snow it is more efficient first to use a blade to clear a narrow lane and then to lift the compacted snow with a rotary plough and throw it to the side than to start throwing at first with a direct attack on non-compacted snow.

During long winters Croce recommends a towed roller for compaction of old snow to make roads fit for traffic. For short winters, he believes it pays to clean the snow down to the true road surface.

The research conducted by Croce to improve the efficiency of snow moving equipment including methods to analyze the power consumption of different snow removing vehicles is described briefly in this report. German developments in snow crossing vehicles are also briefly described.

Increased Florida Road Costs Offset by Gas Tax

Florida's state road department awarded contracts for the improvement or construction of 760 miles of roads and 15,000 feet of bridges during the first 10 months of 1947.

Although increased labor and materials costs forced the department to exceed its budgeted allocations of $20,627,829 by $5,150,098 to get the work underway, Chairman Elgin Bayless said increases in gasoline tax receipts were expected to offset the deficit.

Departmental receipts for the first 10 months were almost as much as had been estimated for the entire year, it was pointed out. To finance its record $50,000,000 program, the Florida road department anticipated gasoline tax receipts of $25,000,000 and federal aid totaling $13,250,000. The gasoline tax produced $22,254,018 in the first 10 months, $3,174,480 was collected from the federal government and $353,895 from incidental sources. It was pointed out that the balance of the federal funds would be received as work progressed on various projects.

Besides the new contracts awarded in 1947, the department continued work on $18,942,069 worth of carryover projects from 1946.

Auto Safety Foundation to Make Kansas Road Survey

Long-range highway construction needs in Kansas will be surveyed by the Automotive Safety Foundation, of Washington, D. C., it was announced at a meeting in Topeka of a 22-member highway study committee created by the 1947 Kansas Legislature.

Donald V. Kennedy, a director of the non-profit foundation, told committee members that his organization had agreed to start the project this month. The state and Federal Public Roads Administration will share the cost of the survey, estimated at $30,000.

Kennedy said the foundation would have an extensive report, along with specific recommendations for a 15-year road building program throughout the state, by Oct. 15, 1948, in ample time for presentation to the next regular session of the Kansas Legislature.

The foundation has employed James O. Granum of Lansing, Mich., as resident engineer for the project. He will supervise the Kansas work, along with a similar study in Nebraska to be conducted at the same time, Kennedy said. An office will be set up in Topeka with a staff of engineers and trained research workers, he added.

Replying to questions as to whether the study would include new methods of raising revenue to finance an extensive construction program, Kennedy told committee members the foundation would not make recommendations on that point.

Senator Riley MacGregor of Medicine Lodge, chairman of the interim committee, said a sub committee on financing probably would be named as soon as the study had progressed to the point where the actual cost of the program could be determined. Possible sources of immediate revenue, he said, might include an increase in the gasoline tax, higher truck license fees, and increased motor car license fees.

Smooth, effortless steering—without stopping the forward motion of the machine—with the cab in any position—that's OSGOOD Air-Controlled Steering! Independent air cylinders, actuated by a small lever in the cab, disengage and set steering brakes on the driving sprockets instantly, eliminating the need to hunt for a point where a steering lock can be engaged.

OSGOOD Air Control means faster, safer operation . . more work done in less time, with less effort. Plan now to choose an OSGOOD . . a complete line of power shovels, draglines, cranes, clamshells, backhoes and pile drivers . . a model for every type of work.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

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DIESEL, GASOLINE OR ELECTRIC POWERED • ⅜ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

Notes from the manufacturers

Robins Conveyors Division, Hewitt-Robins, Incorporated, Passaic, New Jersey, announces the appointment of the St. Louis Railway Supply Company, St. Louis, Missouri, as a distributor of the Division's equipment in the St. Louis area.

The St. Louis company will specialize in sales and distribution of the Robins Car Shakeout, a portable electric-powered materials-handling machine.

Gorman-Rupp Company, Mansfield, O., has announced the appointment of H. W. Vine as Manager of Industrial Sales.

Pennsylvania Refining Company, Cleveland 4, Ohio, has appointed Frank D. Messenger as District Factory Sales Agent for Penn Drake Snow Plow Wax.

Mr. Messenger will operate throughout the lower Michigan Peninsula and will maintain sales headquarters at Fair Haven, P.O. Box 124, Michigan. He will promote sales to highway departments and equipment distributors.

Mack Trucks, Incorporated, Empire State Building, New York City, New York, has appointed Harold J. Fikejs as Manager of the Company's Milwaukee, Wisconsin, direct factory branch.

Barber-Greene Company, Aurora, Illinois, has appointed Capitol Equipment, Incorporated, Troy, New York, as exclusive distributor in the Albany and Mohawk Valley Territory, representing the Barber-Greene Construction and Industrial Divisions.

Products being handled by the firm include bituminous mixing and paving machines, portable bulk material loaders, ditchers, portable and permanent belt conveyors, crushers, and coal handling equipment for retail and industrial applications.

General Tire & Rubber Company, Akron, Ohio, has announced cost list and retail price increases, motivated by the rising costs of raw materials, manufacturing, transportation, selling, and distribution.

All General distributor and consumer prices have been increased as follows: automobile and truck casings, 7½ per cent; farm tractor casings, industrial pneumatic casings, and wheels, 5 per cent.

There will be no changes in the prices of tubes or airplane casings and wheels.

Make Dirt Fly on Tough Jobs

On thousands of varied dig-and-haul jobs, SAUERMAN Machines are piling up profits for their owners. Because of their long operating range, great digging power and fast haulage speeds, these machines are able to handle many difficult jobs below the engineers' estimates.

Above is a typical example. Here a 500-ft. span SAUERMAN Scraper (with the scraper hoist mounted on a skid-frame) is being used to drag gravel from bed of river and build a sloping revetment. The river was deepened to grade and the eroded bank repaired in the same operation. Hourly yardage moved into place averaged about 130 cu. yd. at a cost around 5c a yard.

SAUERMAN Scrapers and Cableways are adaptable to almost any ground conditions. The operator has finger-tip control of the entire cycle of digging, hauling and dumping. Power consumption is low. Maintenance is simple.

SAUERMAN BROS., INC.

Write for Catalog and engineering advice on your problems.

574 S. CLINTON ST. CHICAGO 7, ILL.

Fairbanks, Morse & Company, Chicago 5, Illinois, announces the transfer of J. C. Elmburg, Manager of the Company's Boston branch to the company's Atlanta, Georgia, branch to assume the position of Manager of that area. He replaces G. N. Van Epps, who recently resigned.

The Boston branch will be taken over by V. O. Harkness, who has been Manager of the Diesel Sales Division at Chicago Headquarters. T. M. Robie will become Manager of the Diesel Sales Division.

The Timken Roller Bearing Company, Canton 6, Ohio, has announced the transfer of William E. Bryden, Sales Engineer, from the Chicago office to the Company's Cincinnati office. He will be succeeded at Chicago by William T. Strickland.

Hercules Steel Products Corporation, Galion, Ohio, has announced the appointment of R. J. Nymberg to the position of General Sales Manager. Mr. Nymberg will have charge of sales and advertising of Hercules automotive products and will be assisted by an enlarged staff of sales engineers and district representatives.

Wickwire Spencer Steel Division, Colorado Fuel & Iron Corporation, New York 18, New York, has appointed H.C. Allington, General Manager of Sales.

Detroit Diesel Engine Division, General Motors Corporation, Detroit 28, Michigan, has appointed The Colorado Builders Supply Company Equipment Division, with offices at Denver, Colorado, and Scottsbluff, Nebraska —as industrial distributors for General Motors Series 71 Diesel engines.

The territory covered by the new franchise takes in the entire state of Colorado, with the exception of Moffat and Rio Blanco counties, in addition to the Nebraska counties west of and including Sheridan, Garden, and Deuel.

Swan-Finch Oil Corporation, R. C. A. Building, New York City, New York, has named Anthony J. Zino, Jr. as Assistant Sales Manager of the Industrial Sales Division with Headquarters in the New York City home office.

Jones & Laughlin Steel Corporation, Pittsburgh, Pennsylvania, has announced a plant improvement program now under way entailing the investment of more than $100,000,000. The program covers all departments of the Corporation, and the projects, with one exception, are scheduled to be completed by the end of 1949.

Air Reduction Sales Company, New York 17, New York, has announced several personnel changes in its New

York District. Harold H. Reed, formerly Assistant Manager, has been appointed Manager of the District. Mr. Reed succeeds W. S. Schoenthaler, who is retiring after 37 years of continuous service with the company. Oren M. Donohue, formerly Assistant Sales Manager, has been appointed Assistant Manager, succeeding Mr. Reed. William B. Brower succeeds Mr. Donohue as Assistant Sales Manager.

Gar Wood Industries, Incorporated, Wayne, Michigan, has made several important personnel changes. E. B. Hill has been appointed General Sales Manager and R. F. Whitworth General Service Manager. In addition, four domestic regional sales offices have been created. Promoted to Regional Managers are Ross Miller, San Francisco (Western Region), A. C. Berg, Wayne, Michigan (Central Region), W. G. Barrett, Boston (Northeast Region), and H. C. Hatch, Washington, D. C. (Southeast Region).

Along with the establishment of regional offices, the company has consolidated its operations into three basic divisions. The Findlay Division, Findlay, Ohio, will assume the manufacture and distribution of Gar Wood tractor equipment as well as Buckeye construction machinery. The Wayne Division, Wayne, Michigan, will continue to manufacture and distribute Gar Wood truck equipment, and the St. Paul Division, Minneapolis, Minnesota, will manufacture and distribute St. Paul hoists, bodies, and truck patrols.

Caterpillar Tractor Company, Peoria 8, Illinois, announces the appointments of Kenneth F. Ames, General Sales Department member, Russell S. Cornell and Truman E. Sage, district sales representatives, as assistant sales managers of the Central, Easttern, and Western Sales Divisions, respectively.

The appointments expand the organization of the General Sales Department to include two assistant sales managers in each of the geographical sales divisions. Mr. Ames and Mr. Cornell will make their headquarters at the Peoria plant, and Mr. Sage will serve at the San Leandro, California, plant.

John A. Roebling's Sons Company, Trenton, New Jersey, announces the appointment of L. H. Van Dike, Jr., as its Detroit, Michigan, representative.

E. I. Du Pont De Nemours & Company, Incorporated, Wilmington, Delaware, has announced the promotion of Harry F. Brown to General Manager of its Explosives Department and Samuel G. Baker to General Manager of its Electrochemicals Department. Both men have been assistant general managers of the departments they will head.

Mr. Brown succeeds William H. Ward who was elected a Vice President of the company, and Mr. Baker takes the place of F. S. MacGregor whose retirement after a successful career of 31 years was also announced.

The Hillsman Equipment Company, 228 N. LaSalle Street, Chicago, Illinois, announces that construction is well advanced on a new plant at 2000 North Hawthorne Street, Melrose Park, Illinois. The Hillsman Company is the Chicago and Northern Illinois Distributor for many lines of heavy construction equipment — cranes, shovels, draglines, paving mixers, concrete mixers, trenchers — including products of the Koehring Company and its subsidiaries.

Davey Compressor Company, Kent, Ohio, announces the appointment of J. S. Larkin Company, Harrisburg, Pennsylvania, as distributor of Davey equipment.

The Larkin Company will operate in the following Pennsylvania counties: Dauphin, York, Cumberland, Perry, Juniata, Snyder, Union, Lycoming, Sullivan, Clinton, Center,

THE RIGHT BUCKET IS RIGHT HERE!

You can't go wrong! Exactly the bucket you need is shown in picture and with complete data—in Blaw-Knox Catalog No. 2076.

Here you have the most convenient clamshell bucket catalog ever published—now it is easy to select a bucket for any kind of rehandling, digging or dredging.

Hundreds of buckets to pick from—your job, your equipment, and your conditions can be exactly met—and you will get a bucket which really performs.

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OF BLAW-KNOX COMPANY
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Get Catalog No. 2076—for your library or files—it's yours for the asking.

BLAW-KNOX CLAMSHELL BUCKETS

Mifflin, Huntingdon, Franklin, Lancaster, Lebanon, Northumberland. It will handle Davey Air Chief portable compressors, Heavy Duty Truck Power Take-offs, Mobile Machine Shops, Pneumatic Saws, and Da-V-Lite lighting units. Complete parts and service facilities will be maintained.

LeRoi Company, Milwaukee 14, Wisconsin, announces that C. W. Pendock has resigned as its President and has been elected to the position of Chairman of the Board. E. A. Longenecker, who has been President of the Lauson Division of Hart-Carter Company, has been elected to take Mr. Pendock's place as President of LeRoi.

Manhattan Rubber Division, Raybestos-Manhattan, Incorporated, Passaic, New Jersey, announces the appointment of P. L. Edwards as Assistant Manager of its Central District Office in Pittsburgh.

Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, has just completed and occupied a new branch building at the corner of Airways Boulevard and Dunn Avenue in Memphis, Tennessee.

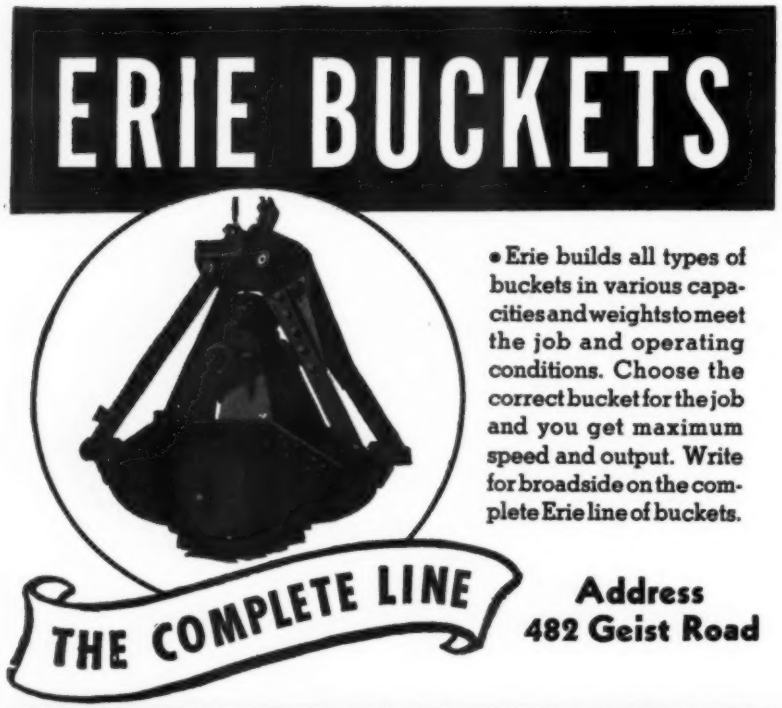
The one story structure is 210 feet by 275 feet, made of concrete and steel construction with brick facing and stone trim. The floor space covers an area of approximately 60,000 square feet.

Hewitt Rubber Division, Hewitt-Robins, Incorporated, Buffalo 5, New York, has announced the appointment of the Industrial Equipment Company of Louisville, Kentucky, as Distributor of its entire line of industrial hose, belting, and packing.

Owned by William A. Mivelaz, the Industrial Equipment Company will serve all industries within a 45-mile radius of Louisville.

The Elwell-Parker Electric Company, Cleveland, Ohio, announces that Ray Perrin, of the Ira G. Perrin Company, for 35 years the west coast representative for Elwell-Parker Trucks, has been elected president of the Materials Handling Association of Northern California.

Koehring Company, Milwaukee, Wisconsin, recently announced the appointment of Sweeney Brothers Tractor Company of Fargo, North Dakota, as distributor for Koehring products in the state of South Dakota.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• Erie builds all types of buckets in various capacities and weights to meet the job and operating conditions. Choose the correct bucket for the job and you get maximum speed and output. Write for broadside on the complete Erie line of buckets.
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Address
482 Geist Road
ERIE STEEL CONSTRUCTION CO.
ERIE, PENNSYLVANIA
Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

New trade literature

Title: **Crushing & Screening Plant Booklet**

Subject: Available for general distribution is this new booklet published by Pioneer Engineering Works on its line of combination portable two-unit crushing and screening plants.

The booklet covers primary and secondary rock and gravel plants, featuring their portability and versatility. Complete specifications are given, together with a guide to proper selection of equipment.

Where to Get: Pioneer Engineering Works, Minneapolis 13, Minnesota. Ask for Bulletin No. 574 (Free).

Title: **Air Drill Hose Folder**

Subject: Hewitt-Robins has just released this new descriptive folder on its "Monarch" and "Ajax" brands of air drill hose designed for heavy-duty service in mines and quarries where resistance to hot oils and abrasion is especially important.

Where to Get: Hewitt Rubber Division, Hewitt-Robins, Incorporated, Buffalo 5, New York (Free).

Title: **Wayne Crane Catalog**

Subject: This 20-page illustrated catalog, No. 406, describes a one-man operated, rubbertired machine serving as a 5-ton crane, ½-yard clamshell, ½-yd. dragline, ½-yard power shovel, or ½-yard trench hoe.

The book gives complete operating and specification data.

Where to Get: Wayne Crane Division, American Steel Dredge Company, Incorporated, Fort Wayne 1, Indiana (Free).

Title: **Batching Plant Folders**

Subject: Features and condensed specifications of Noble batching plants are described in four illustrated 4-page folders. A separate folder is devoted to each of the four plant sizes: 80, 100, 150, and 350 tons. Plan drawings and photographs of field installations are included for each model.

Features mentioned in the folders include the Noble principle of weigh batching with central cement compartment; one-man operation; portability; and flexibility of setup.

Where to Get: Noble Company, 1860 7th Street, Oakland 7, California (Free).

Title: **"Truck Operators' Handbook"**

Subject: This book is designed to provide a printed means by which truck operators can reduce operating costs and thus increase profits by proper selection and maintenance of tires.

Featured in the volume is a discussion of the factors which can be controlled to get the most service out of any truck tire. Suggestions for control of proper air pressures are given.

Overloading and improper load distribution, together with an easy formula for analyzing loads is also a prominent part of the publication, as well as a discussion on speeds and their effects on tire life. Matching and spacing of duals and mechanical irregularities which may cause rapid or uneven tread wear are comprehensively outlined.

The volume illustrates and describes all the most important causes of tire failure and tells how to prevent and repair many tire injuries.

Where to Get: B. F. Goodrich Company, Akron, Ohio (Free).

Title: **"Terra-Cobra" Bulletin**

Subject: Improved operation and construction features of the Wooldridge "Terra-Cobra" self-propelled earthmovers are illustrated and described in this new 12-page bulletin.

Descriptive data is combined with on-the-job photographs to show engineers, contractors, and equipment owners, how "Terra-Cobras" can be used in earthmoving operations. Positive two-wheel hydraulic steering action and flexibility articulated oscillating king pin pivot are among the features covered in detail in the new bulletin.

Where to Get: Wooldridge Manufacturing Company, Sunnyvale, California. Ask for Bulletin No. TA-750 (Free).

Title: **"Caterpillar" Booklet**

Subject: The ever increasing dependence of the railroads upon earthmoving equipment for maintaining road gradings and other off-track repairs is emphasized in this new "Caterpillar" booklet.

"Caterpillar" equipment, from the smallest unit to the diesel D8 track-type tractor and attachments for the various units, is pictorially described in the booklet, performing a variety of railroad chores.

Where to Get: Caterpillar Tractor Company, Peoria 8, Illinois. Ask for Form 10605 (Free).

Title: **"Hi-Boy Trukmixer" Bulletin**

Subject: A bulletin describing the "Hi-Boy Trukmixer," a high discharge type of truck mixer, has just been published. The pamphlet is illustrated with service and construction views and gives specification data and operating information on the new unit.

Where to Get: Blaw-Knox Company, Pittsburgh, Pennsylvania. Ask for Bulletin No. 2223 (Free).

Choice of the HEAVIES

for Trucks - Tractors Trailers - Buses Cars and Heavy Equipment of all kinds.

Ask your GATKE Jobber or write.

Just consider these time- and money-saving Extra Values!

Smooth, Non-Grabbing Action adds countless miles to tire life — promotes SAFETY, reduces driver fatigue and avoids needless strain on equipment.

Dependable Holding Power at all service temperatures — no loss of efficiency under prolonged use.

Greater Wear Life — longer service with fewer adjustments.

COMPARISON PROVES. Use GATKE *CUSTOM-BILT* Brake Blocks for your next five relines and compare results.

Gatke CUSTOM-BILT BRAKE LININGS
BLOCKS SETS ROLLS SHEETS
GATKE CORPORATION
232 N. La Salle St., Chicago 1, Ill.

Biggest Inch

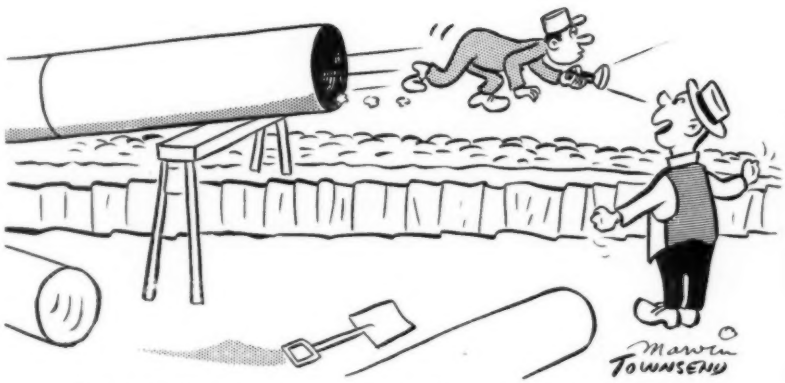
(Continued from page 28)

ing the seam, was required to have a minimum yield strength of 52,000 pounds per square inch, and ultimate yield strength of 72,000 pounds per square inch.

Backfill to Shade Pipe

After the pipe had been lowered into the trench, it was shaded during the early morning hours of the following day. The shading equipment used consisted of a small 2-man tractor with a long side arm to which was attached a shallow scoop about five feet long. The scoop, operated by one man, pulled the spoil from across the trench and at right angles to the trench, flowing the material over the pipe to a depth of about ten inches. After each scoopful, the tractor was moved ahead by the other operator a distance of about four feet. This same equipment later completed the backfill, being followed by a TD-18 International-powered Bucyrus-Erie bulldozer, which dressed up the right-of-way.

In planning the job, it was anticipated that about five miles of line would be in rock where there would be insufficient fine material available for padding the ditch and shading the pipe, and this condition was provided for in the specifications. However, during the right-of-way grading operations, it was found that the desert surface conditions did not always exist at trench depth, and that the spoil bank was composed of material much too large to safely backfill on the coated pipe.



"All right Hines, that's enough inspection until we lay more pipe!"

Consequently, it was realized that to prevent damage to the protective coating, it would be necessary to devise some means of segregating the available fine material for use as shading over the pipe. The need was for something which would work with the backfiller, and at the same rate, since the time available for shading operations was limited to the early morning hours.

For this purpose, a piece of equipment was devised, consisting of an 8-ft. length of 2-in. pipe reinforced by a piece of railroad iron. Bars of cold rolled steel 1 and ½-in. by ½-in. alternately 7 and 8-ft. long, were looped around the 2-in. pipe. Each bar had a 1-in. by 2-in. shoe at the trailing end to give an upward lift as the bars were moved forward.

Each bar was free to move vertically and independently of its neighbor, and, due to the loose fit around the pipe and the normal flexing of the flat bar, some lateral movement was obtained. The movement in either plane was least near the 2-in. pipe, thus closely controlling the size of material in contact with the pipe coating.

Drawn by Separate Tractor

Although it was thought that this equipment should be attached to the backfiller and moved by it, the backfiller was found to be unable to pull the added load. A separate tractor was used, its moves being co-ordinated with those of the backfiller. In operation, the backfiller pulled the spoil

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TURBO and BELT DRIVEN
for LIGHT and POWER
The Ideal Small Power Plant
IMPORTANT MOON FEATURES
• GOVERNOR AND COMPOUND WINDING on steam-driven models prevent excess voltage output which might injure electrical equipment.
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For Lights . . . Ventilating Fans . . Other Electrical Equipment . .
SEND TODAY FOR ILLUSTRATED CIRCULARS. MODELS FROM 1 TO 7½ KW CAPACITY.
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onto the grating, and the towing tractor moved ahead about four to five feet—this movement tending to shake the finer material through the bars and on to the pipe, the coarser material sliding off the ends of the bars to the rear.

Although the normal trench width was only 40-in. this device was made eight feet wide, since, wherever its use would be required, the material was invariably of such a nature that the trench banks would not stand uniformly, and in many such cases, the trenching was done with a drag shovel. Where the trench width was 40-in. the outer two quarters of the bars lay flat on ground surface, and as the trench widened, more bars became active in screening the material.

Since river crossings constitute the most important potential source of service interruption in the territory traversed by the pipeline, they are worthy of special mention. The larger streams crossed by the line throughout its 1214-mile length, are the Canadian, Pecos, Rio Grande, San Pedro, Gila, Colorado, and Santa Ana. Except for the Santa Ana, crossings on all these rivers were of the cable suspension type. Span lengths between supports ranged from 250 feet for the Rio Grande, to 1200 feet for the Canadian.

Colorado River Bridge

At the Colorado River, the line crosses the channel on a suspension bridge with a span between towers of 1040 feet and at a height above the river of about 40 feet. The bridge-tower foundations consist of 11-ft. diameter caissons sunk to 56 feet with 14 steel beam pilings driven to firm footing below the caissons. On the Arizona side of the river, rock was reached at 65 to 70 feet. But on the California side, a depth of 150 feet below ground was necessary before firm footing was reached.

In sinking the caissons, several large trees were encountered at about 35-ft. depth. These were cut outside the caissons with a special tool driven by a pile driver. After cutting, the crew brought the trees to the surface through the caissons, and found them to be 18 to 20 inches in diameter.

The main cables and wind cables were anchored in concrete blocks 40-ft. long by 20-ft. wide and 15-ft. deep. These blocks were secured by 35 steel H beam pilings driven on a 4 to 1 batter.

This newly completed 1214-mile pipeline solves for the time being at least, a gas supply problem which had become increasingly acute. California is experiencing a tremendous growth in population, as well as a steadily increasing expansion in business and industrial activity. But now, with the completion of the Biggest Inch, gas company officials predict that the gas needs of the area will be adequately met for many many years to come.

Other Current Projects

H. C. Price Co. is one of the outstanding pipeline constructors in the field, having handled some of the biggest construction jobs in the country, including the giant Canol Project in the frozen North, which Price handled in association with other contractors. Recently completed by the company is the new Standard Oil of Indiana pipeline servicing Northern Illinois, Northeastern Iowa, and much of Wisconsin, Minnesota, and North Dakota, and a section of the 647-mile, 20-in. crude-oil pipeline from Corsicana, Texas, to Patoka, Illinois, for the Magnolia Pipe Line Company. Among other of the company's current jobs is construction of 260 miles of 10-in. line for Sinclair Refining Company — running from Houston to Arlington, Texas.

The H. C. Price Co. together with the Bechtel Corporation of San Francisco, the Morrison-Knudsen Company of Boise, Idaho, R. A. Conyes of Oakland, California, and Sverdrup & Parcel of St. Louis, Missouri, has been awarded a contract to build the world's greatest pipeline for carrying crude oil — in Saudi Arabia, for the Trans-Arabian Pipe Line Company. This 1,050-mile pipeline, 30 inches in diameter,

(Continued on page 72)

A ROGERS 'Tagalong' Trailer AND YOUR DUMP TRUCK

...form a PROFIT-PRODUCING TEAM

Contractors everywhere are turning to the Rogers "Tagalong" for a bigger day's work with maximum economy.

One man can do all jobs. Load and unload trailer, connect and disconnect it; drive truck and operate equipment carried.

Ideal for light and medium shovels, cranes, bulldozers, etc.

Write for complete information.

Showing cable around sheave and dump body about to be raised to engage towing tongue.

Body elevated. Tightened cable has raised drawbar and engaged towing tongue. Safety coupling pin is inserted. Trailer is ready to roll when body is lowered.

ROGERS HEAVY DUTY Gooseneck Trailers

ROGERS BROTHERS CORPORATION

DESIGNERS and BUILDERS of HEAVY DUTY TRAILERS SINCE 1915

136 ORCHARD ST. ALBION, PENNA.

HOT in the Contract

Two skinners at a carnival approached a stall where little balls bobbed about on top of water jets. They made a bet on who was the better shot and the first fellow tried his skill without success.

Then his friend took up a rifle and fired. Every ball dropped.

"Gee. I didn't know you could shoot like that. How did you do it?"

"Easy. I shot the man who was working the pump."

First Passenger: "I'm quite a literary man, you know. I've contributed to the Atlantic Monthly."

Second Passenger (leaning over the rail): "Know what? I've contributed to the Atlantic *daily*."

They wandered alone in the graveyard,
'Til they sighted a mossy old slab.
But later while dancing, he saw on her back:
"baNcM ynneJ fo ydob ehT."

"Who was the first electrician?"

"Adam. He furnished the spare parts for the first loudspeaker."

"What's in the fancy vase on the mantle?"

"My husband's ashes."

"Oh, I'm sorry. How long has he been dead?"

"He's not. Just too lazy to find an ash tray."

"I think we'd better take Grogan off the shovel for a while!"

A guard from the lunatic asylum rushed up to a road contractor and said, "I'm looking for an escaped lunatic. Did he pass this way?"

"What did he look like?"

"He was a short, thin man weighing about 350 pounds."

The contractor looked at him in amazement.

"How can he be short and thin and weigh 350 pounds?"

"Don't be silly," retorted the guard. "I told you he was crazy, didn't I?"

"Whatcha got there, chum?"

"Gallon of whiskey."

"How come?"

"Going in the woods. Might get bit by a rattlesnake."

"Whatcha got in the box?"

"Rattlesnakes."

George doesn't look so well today. He says his wife told him last night that one of the ducks he'd been out shooting the day before had called and left her number.

Shoulders thrown back proudly, the old mountaineer strode from the village postoffice when the letter had been read to him.

Outside, he made his way immediately to a gathering of his cronies in the chinaberry's shade.

"My boy, Eph," he announced so that all could hear, "has got his sentence cut down six months fer behavin' good."

There was quick interest. A grizzled hillbilly raised himself on an elbow.

"Hit's moughty nice," he commented, "to have a boy that does you sech credit."

Once upon a time there was a boy penguin and a girl penguin who met at the Equator. After a brief but charming interlude, the boy penguin went north, to the North Pole; the girl penguin went south, to the South Pole.

Later on, a telegram arrived at the North Pole, stating simply: "Come quick—I am with Byrd."

a thousand and one

MACWHYTE WIRE ROPES

When you use the correct wire rope, both the rope and your equipment last longer, cost less to operate. Macwhyte consulting engineers will check your equipment and recommend the wire rope specifically engineered for your job. Ask your Macwhyte distributor, or write Macwhyte Company.

...all job-proved... assure you the correct rope for your equipment

MACWHYTE PRE-FORMED AND NON-PREFORMED INTERNALLY LUBRICATED WIRE ROPES... MONARCH WHYTE STRAND Wire Rope ...Special Traction Elevator Rope ...Stainless Steel Wire Rope ...Monel Metal Wire Rope... Galvanized Wire Rope... Spring-lay Wire Rope... ATLAS Braided Wire Rope Slings, Hi-Fatigue Aircraft Cables, Assemblies and Tie-Rods. Catalogs on request.

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Mill Depots: **New York • Pittsburgh • Chicago • Minneapolis • Fort Worth Portland • Seattle • San Francisco • Los Angeles**
Distributors throughout the U. S. A. and other countries

NO. 9189

New Equipment

(Continued from page 32)

is 25 degrees and the maximum tilting adjustment is six inches.

Concrete-Sealing Compound

Manufacturer: United States Rubber Company, Rockefeller Center, New York City, New York.

Claims: This new rubber compound, inserted in the joints between concrete slabs, is said to be a highly effective seal against the weather. The compound stretches in winter and compresses in summer without breaking or separating from the concrete, thereby eliminating water seepage and helping to prevent heaving and breaking of pavement.

Front - End
LOADERS
For Industrial Tractors
Extensible Booms,
5/8-cu. yd., Bucket 8-foot lift,
Backfiller Blades
White Mfg. Co.
ELKHART INDIANA

Motorized Wheelbarrow

Manufacturer: Whiteman Manufacturing Company, Los Angeles 26, California.

Claims: The new "Whiteman Power Buggy," a motorized wheelbarrow and dumptruck, is said to be able to haul a variety of materials: wet concrete, dirt, bricks, ore, tools, or refuse. It can handle 2,000 pounds of 12 cubic feet at speeds from 2 to 15 m. p. h., forward or reverse; go up a 25 degree ramp with a load; turn in its own radius; pass through doors and narrow passages.

Extra Power Supply for Portable Welder

Manufacturer: Harnischfeger Corporation, Milwaukee 14, Wisconsin.

Claims: A new feature of the recently announced P&H Model WN-200 portable arc welder is its extra power supply. Offered as optional equipment, the unit provides 1½ kilowatts of alternating current at 115 volts, single phase. This enables operators to hook up electric lights for floodlighting while welding. It also permits the use of electric powered tools, such as grinders, chippers, drills. Any AC-DC portable tool may be operated from this additional power source.

"Gumout" Carburetor Cleaner

Manufacturer: Pennsylvania Refining Company, Cleveland 4, Ohio.

Claims: "Gumout" is a new liquid carburetor and fuel system cleaner that is also said to prevent gas line freezing. According to the manufacturer, one pint of "Gumout" added to ten gallons of gasoline, once a month or every 1,000 miles of driving, completely dissolves all gum and foreign deposits, keeping carburetor jets, needle valves and the entire fuel system open and clean.

Circular Slide Rule

Manufacturer: Tavella Sales Company, New York 7, N. Y.

Claims: The new "Dualog" slide rule, 9½ inches in diameter on white Vinylite, is a scientifically designed computing instrument and is intended for the rapid solution of mathematical problems involving multiplication, division, proportion, trigonometric functions, logarithms, etc. The log scales provide means for the direct extraction of any root or power of numbers.

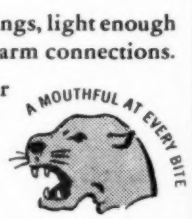
This circular slide rule is said to be simple to operate. It requires no knowledge of the underlying principles upon which the slide rule is based. It has all twelve of its scales on the face side of the rule, thus permitting direct transfer of reading from one scale to another without reversing sides and carrying over.

OWEN BUCKETS *are popular* *for* **LOW HEADROOM**

and thus are more adaptable to various operating conditions.

Owen Bucket heads are one-piece alloy steel castings, light enough to prevent top heaviness and designed for rigid arm connections.

Special head design eliminates wear on upper arm ends. Rack and wobble is prevented.



The Owen Bucket Company
6095 Breakwater Avenue, Cleveland, Ohio
Branches: New York • Philadelphia • Chicago • Berkeley, Cal.

Curbing Yazoo Floods

(Continued from page 19)

in 12-in. lifts and compacted with smooth rollers.

No major concrete construction has been initiated to date, but work on the construction of the concrete spillway is scheduled for commencement this spring. Embankment work now in progress will be protected from flood waters of the Yalobusha River by an earth coffer dam which encloses the riverward end of the embankment and ties into high ground. Dewatering of the coffer dam area will be accomplished by surface pumping. Diversion of the river will not be attempted until after completion of the outlet structures at a later date.

Practically all labor used on the job has been recruited from within the state of Mississippi and at present the contractor is working approximately 250 employees. Two 11-hr. shifts per day, six days per week, are being worked. A tent camp—constructed by the contractor at the job site—for colored employees is the only housing provided.

Enid Dam

Enid Dam will also be a rolled filled structure, 8,400 feet in length at the top elevation of 293 m.s.l. with a crown width of 30 feet, an average height of 85 feet above the valley floor and a maximum height of 103 feet above the stream bed. The total estimated volume of the embankment is 6,000,000 cu. yds. The upstream and downstream slopes will receive the same protective measures as for Grenada.

A toe drainage system similar to the Grenada installation will also be provided. Regulation of outflow from the reservoir will be by means of a controlled outlet structure to be constructed in the north abutment adjacent to the river valley. The outlet works will consist of an approach channel, intake, transition and conduit, stilling basin and outlet channel.

The intake will consist of a concrete control structure with twin passages, each regulated by means of an 8 x 16-ft. caterpillar-type gate with hoisting equipment located in the operating house surmounting the structure. The conduit will be of concrete with twin circular passages, each 11 feet in diameter, and invert elevation of 205.5. The stilling basin will consist of a flared chute and level basin with vertical side walls, and a central dividing wall to confine the discharge from each passage of the twin conduit.

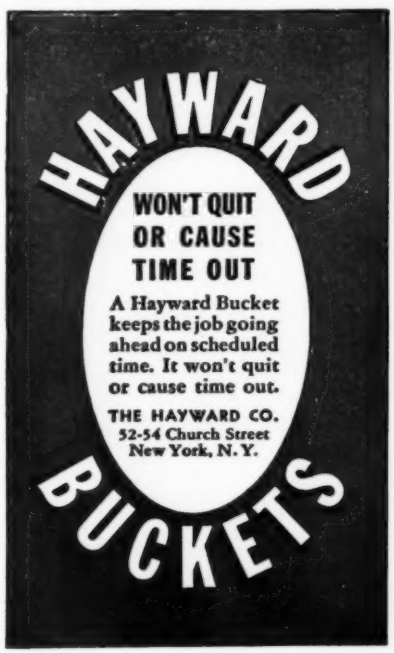
Spillway in North Abutment

Protection of the dam against possible overtopping will be provided by an uncontrolled chute-type spillway to be constructed in a saddle in the north abutment ridge. The spillway will be 200 feet in width with a crest elevation of 268, and is designed to discharge 48,300 c.f.s. at surcharged pool elevation 284 m.s.l.

The reservoir created by the dam will have a total storage capacity of 602,400 acre feet at spillway crest level and the lake formed at this elevation will have a surface area of 41,300 acres. A conservation pool will be retained at elevation 230 m.s.l. and the dead storage below this level will be 57,600 acre feet.

At the damsite, the flood plain of the Yocona river lies close against the north abutment hills and is bordered on the south by a broad gently rising terrace. A geological investigation of the area indicated that the valley has been refilled with a recent alluvial deposit consisting of a blanket of relatively imperious silts and clays underlain by strata of sands and gravels of varying thicknesses.

Construction of the spillway and a major portion of the embankment is now underway and construction of the outlet structures and the river closure section will be undertaken at a later date. Creation of the reservoir will necessitate extensive clearing as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WON'T QUIT OR CAUSE TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD CO.
52-54 Church Street
New York, N. Y.
BUCKETS

save time between jobs with JAHN TILT TRAILERS
Tilt—load—and you're off in a matter of minutes with a Jahn Tilt Trailer. No jacks or loading ramps required. One-man operation. Positive, automatic safety lock holds platform in position when loaded or empty. Rubber mounted drawbar absorbs road shocks and protects both truck and trailer. Ideal for transporting tractors—rollers—compressors—shovel-loaders—mixers, etc. Jahn Tilt Trailers are available in 8 ton capacity tandem axle and 5 ton capacity single axle models. Write for specifications and illustrated bulletin or see your nearest Jahn distributor.
JAHN TRAILERS
HAULED by the WORLD!
C. R. JAHN COMPANY
Dept. 1349—1106 W. 35th Street, Chicago 9, Illinois
Heavy duty trailers from 5 to 100 tons

well as the relocation of a portion of Mississippi state highway 32, various county roads, and power, telephone and telegraph utility lines. The cost of the project including right of way and relocations is estimated at approximately $13,000,000.

Will Complete Next Year

A contract for the construction of a major portion of the Enid embankment, the spillway and appurtenant works was awarded on January 14, 1947, to T. L. James and Company, Inc., and Guilliams Bros., Ruston, Louisiana. Work was initiated on February 10, 1947, and is scheduled for completion on December 16 of next year. The amount of this contract is $5,431,471.50. Tobe Guilliams is in charge of field operations and D. I. Guilliams is acting as project manager for the contractors.

Construction of the relief wells for the downstream toe drainage system of the dam has been subcontracted to Layne-Central Company, Memphis, Tennessee, by the prime contractors, and production of pervious material has been subcontracted to Kochtitsky and Johnson of Batesville, Miss.

Excavating equipment on the job at Enid includes two Bucyrus-Erie 54-B draglines with 4-yd. buckets, a Koehring dragline with 3-yd. bucket, a Koehring 703 dragline with 2¾-yd. bucket, a ¾-yd. P & H 1924 dragline, a 75-B Loraine 1½-yd. shovel, a 75-A Loraine 1¼-yd. shovel, and two 8-R-1 Caterpillar 13-yd. scrapers.

All excavation is classified as common, and will include 200,000 cu. yds. of stripping, 6,500,000 cu. yds. from borrow and spillway areas, and 330,000 cu. yds. from the outlet channel and toe drainage system. At present, the contractor is hauling about 10,000 cu. yds. of excavation per day. Three sources of borrow have been designated for embankment materials needed to supplement required excavation from the spillway and outlet channel.

To utilize effectively the various materials available, the embankment section was divided into zones of select impervious, random and relatively pervious materials. Material for the pervious portion of the embankment (foundation blanket) is being obtained from borrow area No. 2 and hauled in dump trucks to the washing plant where it is processed prior to incorporation in the dam.

The hauling equipment now in use includes nine 13-yd. Euclid 671-RA trailer trucks, four 13-yd. Euclid 671-RC trailer trucks, four 8-yd. Caterpillar 3-R-5001 trailer trucks, and twelve 3-yd. dump trucks. The average length of haul is approximately 4000 feet and is made over temporary haul roads constructed by the contractor. Each unit is averaging about four loads per hour.

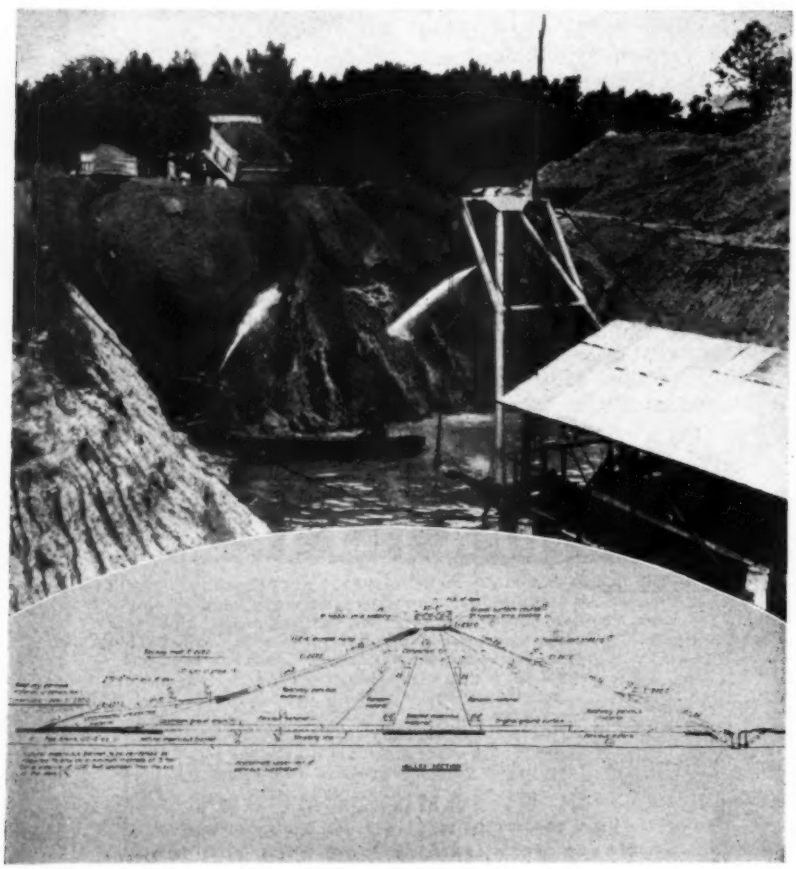
Except for the pervious fill, the embankment is being compacted in 6-in. layers by means of sheepsfoot rollers—four Tampo 400's. Eight complete rollings on each lift are specified, with additional rollings, if required, to be paid for separately. The pervious portion of the fill is being compacted in 12-in. lifts using smooth rollers.

Construction of the concrete spillway will start this spring. Embankment work now in progress is being protected from flood waters of the Yocona River by earth cofferdams which inclose the riverward ends of the embankment and tie into high ground on either side of the river. Dewatering of the cofferdammed areas is being accomplished by means of surface pumping. Diversion of the river will be effected upon completion of the outlet structures.

The contractor has not found it necessary to provide housing for his employees in general. However, he has constructed five frame houses in the vicinity of the job for certain key personnel. At the present time, the contractor is working three 8-hr. shifts per day, six days per week and is employing approximately 250 workers. Practically all labor has been recruited from within the state of Mississippi.

• Below: Ford and Chevrolet 3-yd. trucks dump pervious material into dredge sump for processing in the Enid washing plant.

• Bottom: Typical embankment section for Enid Dam.



TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces as punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15 of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES AND DRAGLINES
2½ YDS. AND UP

Bucyrus-Erie Model 320-B 8-cu. yd. Ward-Leonard electric combination stripping shovel and dragline. Caterpillar mounted. Available January, 1948. Located Southwestern Indiana. Box 3259

120-B dragline equipment, 90′ boom, 4 yd. bucket. Has never been used. Central location. New equipment. Box 3254

SMALL SHOVELS, CRANES AND DRAGLINES
UP TO 2½ YDS.

Link Belt Speeder 1½-yd. dragline K-360 Caterpillar diesel, hydraulic controls, 60-ft. boom, 15-ft. extension, gantry. Used on one job. D. T. Frank Estate, 416 Clifton Blvd., East Lansing, Mich.

Bucyrus-Erie 41-B electric shovel, weight 88,000 lbs. Completely rebuilt, all motors factory reconditioned. Large group spare parts included. Central location. Box 3252.

MISCELLANEOUS EQUIPT.

Gar Wood 2-wheel scraper, 5 yd. Model 25, Serial No. 6267, complete with hoses, control, tank reserve. Good condition, $1,950.

Davenport Coal Company
New Leipzig, North Dakota

Rent or Sale

10-B Bucyrus shovel or dragline
1-yd. Northwest shovel or dragline
1½ yd. Northwest shovel or dragline
2-yd. Bucyrus dragline, 70′ boom
3-W Monighan or 40A Marion
2-yd. high lift Marion shovel
5W Monighan
20-yd. Marion dragline 170′ boom
A. W. NEVERS Phone 32 Mt. Pleasant, Iowa

USED 18" OR 20" ELECTRIC HYDRAULIC DREDGE. MID-WESTERN LOCATION. AVAILABLE IN 1948 BOX 3251

New K.B.S.-12 International truck, 161 W.B. air brakes, 586 cu. inch motor, 1100x20 12 ply tires. 5 speeds.

Schoenmann Garage
Finloyson, Minnesota Phone 65

¾-yd. dragline, heavy duty Koehring, has nearly new diesel motor. Has new tracks, new drums, new drum shafts, new bushings, 40 ft. two piece boom. Can be seen working, available at once. Model 301 Koehring. Price $7,000. F.O.B. Logan, Iowa.

La Plante Choate scraper, Model C-86, about 17 cu. yd. Has all extra good tires, an extra good scraper. Our price $2,000. F.O.B. Logan, Iowa.

P. K. Duvall, Incorporated
Logan Iowa

Bucyrus D-2 diesel 1-yd. crane-shovel.
Bucyrus-Erie 34-B 1½-yd. diesel shovel.
B-E 50-B shovels, diesel, electric, steam.
B-E 8-yd electric shovel-dragl., 320-B.
Manitowoc 2000-B diesel crane, 1½-yd.
B-E 120-B electric shovel-dragl., 5-yd.
Link-Belt 1¼-yd. gas shovel-dragl.-crane.
Draglines, 2, 2½, 3-yd., diesel, elec.
Whirley portal gantry crane, elec., 110′ bm.
Marion 20-yd. electric dragline.
A-C gyratory crushers, 27" (2), 16".
Jaw crushers, 42"x48", 25"x40", 24"x36".
Koehring 27E paving mixers, 2-A (3).
Austin, P&H, Buckeye trenchers.
Plymouth 20 and 10-ton gas locomotives.
Steam locos., 17-18 ton, 36" ga., rebuilt.
Traylor rotary coolers (6), 8'3"x46'.
Sturtevant No. 2 rotary fine crusher, reblt.
Steam turbo power plant, 2250 HP, complete.
Shovel front attach., 2½ yd., 52B-55B.
H. Y. SMITH CO., 828 N. B'way, Milw. 2, Wis.

New
BUCYRUS - ERIE
PARTS!
From U. S. Govenment Surplus

Parts For: 33B, 37B, 54B, and 120B. Gears, Pinions, Bearings, Bushings, Lining, etc.

Immediate Delivery From Available Stock. . . . At a Savings While They Last!

FURNIVAL
Machinery Co.
5405 Lancaster Ave., Phila. 31, Pa.
TRinity 7-5200

Surplus Swivel Hook Double Sheave Blocks

2 10 ton "American" 14" swivel hook double sheave block, diamond pattern with cast steel sheave bushed with self lubricating bronze bushings, grooved for ⅝" rope. Groove diameter 12¼" equipped with 100 lb. cheek weights. 2½" swivel hook. Approximate shipping weight 284 lbs. American Hoist & Derrick Co. Dwg. 1-M-6560.

1 10 ton "American" 14" swivel hook double sheave block, diamond pattern with cast steel sheaves bushed with self-lubricating bronze bushings. Grooved for ¾" rope. Groove diameter 10½" equipped with 100 lb. cheek weights. 2½" swivel hook. Approximate shipping weight 235 lbs. American Hoist & Derrick Co. Dwg. 1-M-6560.

1 40 ton "American" 24" swivel hook double sheave block diamond pattern with cast steel sheaves grooved for ⅞" rope. Sheaves to be bushed with plain bronze bushings, with center bored sheave pin and ¼" Alemite hydr. grease fitting No. 1980 equipped with 800 lb. cheek weights and 8½" swivel hook. Total weight of block 1190 lbs. Dwg. BEFP 1-M-6560.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

ALL-STEEL DERRICKS

19—30 ton capacity BRAND NEW Wiley all steel stiffleg derricks, 32′ masts, 60′ booms, complete; can furnish with gasoline, electric or steam hoists.

ALSO

Air compressors, bins, boilers, cable, conveyors, cranes, crushers, engines, hammers, conc. mixers, light plants, pneumatic tools, pavers, pumps, saw rigs, welders.

EQUIPMENT CORPORATION of AMERICA

CHICAGO 12 1170 S. Washtenaw Av. | **PHILADELPHIA 2** 1505A Race St. Schaff Bldg.
PITTSBURGH 30 P.O. Box 9330 | **NEW YORK 7** 30D Church Street

Modern floating washing plant, capacity 200 yards per hour. Located Northern California on paved road near railroad. Available now. For particulars address owner, William von der Hellen, Box 1026, Medford, Oregon.

One P&H 555 shovel front. New.

One P&H 600 shovel front. Completely rebuilt.

Duval Engineering & Contracting Co.
P. O. Box 1588 Jacksonville, Fla.

(Classified continued on page 72)

For Sale

(Continued from page 71)

¾-yard dipper for Bucyrus-Erie 20-B shovel. Used very little and in excellent condition.
Box 3258

1—Shovel, 1¼ yd. Lorain, 75-A gasoline powered cond. perfect.
1—Bulldozer Allis-Chalmers HDW-7 Baker Blade, front mtd. pump perfect.
1—3 yd. hydraulic Gar Wood scoop w/rear mtd. pump for above tractor. 3-GMC 6x6 dump trucks w/5 yd. Gar Wood bodies & hoists new.
FALK BROS.
Belmont 5260-61
2225 Kirk Ave. Baltimore 18, Md.

Railroad Bridges for Sale
3—Double track half through girder bridges, 80-foot span, now in use under unrestricted main line traffic. Can be delivered in early Spring.
1—Single track half through girder bridge, 75-foot span, suitable for branch line operation. Can be delivered at once.
For detailed information contact John F. Casey Co., P. O. Box 1888, Pittsburgh 30, Pa.

SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—½ cu. yd. Skimmer Scoop Dipper—17-B.
1—2 cu. yd. Rock Dipper 75-B.
F.O.B. Works
Write for any further information desired
BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee Wisconsin

Trackson Model CB9 bulldozer attachment for use with Model CT9 swing crane when mounted on TD9 International Tractractor. $450.
Tri-State College, Angola, Ind.

New
DERRICKS
(ALL-STEEL, STIFF-LEG)
3 Available!
From U S. Government Surplus. 30 Ton at 38 ft. radius; 60 ft. Boom with Bull Wheel.
Priced At a Saving!
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FURNIVAL MACHINERY CO.
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TRinity 7-5200

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Step up your own skill with facts & figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in handy form. Fully illustrated. Easy to Understand. Highly Endorsed. Check book you want for 7 days' Free Examination. Send no Money. Nothing to pay postman. ☐Carpentry $6 • ☐Auto $4 • ☐Oil Burners $1 ☐Sheet Metal $1 • ☐Welding $1 • ☐Refrigeration $4 ☐Plumbing $6 • ☐Masonry $6 • ☐Painting $2 • ☐Radio $4 ☐Electricity $4 • ☐Mathematics $2 • ☐Steam Engineers $4 ☐Machinist $4 • ☐Blueprint $2 • ☐Diesel $2 • ☐Drawing $2. If satisfied you pay only $1 a month until price is paid.
AUDEL, Publishers, 49 W. 23 St., New York 10, N. Y.

WANTED

Shovel front to fit Bucyrus 43-B 1¾ or 2-yd.
Box 3255

Stripping shovel (high lift) 2-yd. or larger.
Box 3256

5W; 7W; or 9W Monighan dragline. Box 3257

One coal sizer 48" wide.
Davenport Coal Company
New Leipzig, North Dakota

WANTED: Diesel dragline and floating washing plant minimum 125 yds. per hour. Will buy, lease or work on shares. Could use dragline alone.
Box 3244

Clay's the Thing

(Continued from page 23)

Belt Dryer system. Pure kaolin is now ready for shipment.

During the past year, more than 600,000 cu. yds. of overburden were stripped from both mines to produce some 250,000 cu. yds. of raw kaolin. New uses for the product developed during the past war have brought about a 50% expansion and additional expansion programs are either underway or under serious consideration.

• Loading kaolin to 1½-ton Ford truck in United Clay Company's Sanderville, Ga., mine is this Northwest 25 dragline with ¾-yd. Page bucket. The 18-ft. seam lies under 50 ft. of red clay overburden at this point.

Operating officials of Edgar Brothers Company include C. D. Frobes, general manager, Tom Falknor, general superintendent, Curtis Chambers, mine foreman, Washington County Mine, and Jack Waltom, foreman at Klondyke Mine.

Kaolin is somewhat of a miracle product. Even though it finds constantly developing use in many industries, over 50% of all kaolin produced still goes to the paper industry where it is used as a filler and coating. The remainder is used by the rubber, ceramics, paint and plaster, linoleum and miscellaneous industries. Lately it has been employed as an extended carrier of DDT. It is the main ingredient of white shoe polish. The paper this magazine is printed on was made possible through the use of kaolin.

Biggest Inch

(Continued from page 65)

will be laid from the Saudi Arabian oil fields, across barren desert sands and hills, to the Mediterranean Sea.

The contract includes 650 miles of the 30-in. line on the east end of the Trans-Arabian Pipe Line Company project, construction and engineering work for the Saudi Arabian Government, and various projects for the Arabian American Oil Company and the Bahrein Petroleum Company. By 1949, when the line is expected to be completed, the Arabian oil fields will be producing 500,000 barrels a day. The entire project will mean an outlay of approximately $1,300,000,000 and will represent the biggest overseas American business undertaking.

Company Personnel

Chief personnel of the H. C. Price Co. include Harold C. Price, president; M. L. Price, vice-president; J. P. Neill, vice-president, and C. S. LeNoir, general superintendent, of the pipe line division; J. S. Dewar, vice-president, and Lloyd Bryan, general superintendent and chief engineer of the Somastic Coating division.

Serving in the pipe line division of field construction are R. K. Shivel, superintendent at Corona, California; W. B. Williams, superintendent at Blythe, California; and A. M. Wimberly, project office manager at Los Angeles; Roy Burgess, office manager at Corona, California; P. O. Rutledge, office manager at Blythe, California. The field work in California was carried out by two crews, the first of which was supervised by W. B. Williams, superintendent, and the second by superintendent R. K. Shivel.

Cut Truck-loading Time...

Barber-Greene

Cut Stock-piling Costs...

Speed up—*and Save*—with B-G "Portables"!

Trucks can make round trips faster if you turn over your loading problems to one or more B-G Portable Conveyors—and stock-piling service is a "natural" for them, too.

Used singly or in "teams," B-G portable Conveyors carry sand, crushed rock, coal and other bulk materials at a constant flow that means fast, low-cost loading, unloading and stock-piling. Power consumption is low, maintenance is negligible.

The B-G Heavy-duty Portable Conveyors shown above are only examples of the many popular types and capacities in the broad Barber-Greene line. See your Barber-Greene distributor.

Standardized construction: B-G "Portables" are easily lengthened or shortened by simple addition or removal of sections.

◆

Highly portable for travel—readily moved around the job.

◆

B-G Portable Conveyors are available in a broad range of capacities and types.

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Available with either electric or gasoline power.

BARBER-GREENE COMPANY · AURORA, ILLINOIS

Constant Flow Equipment

LOADERS · PERMANENT CONVEYORS · PORTABLE CONVEYORS · COAL MACHINES · BITUMINOUS PLANTS · FINISHERS · DITCHERS

FOR PIONEER CONTRACTING CO. SINCE 1935

● Pioneer Contracting Co., Inc. of Dyersburg, Tennessee has been a steady user of Euclid Equipment since it first purchased Bottom-Dump Euclids in 1935 for levee work. One of the leading dam and levee contractors, this company has constantly added to its fleet because it has found that Euclids consistently move dirt at lowest cost per yard on the toughest jobs.

"We have used 'Eucs' continually", reports Guy Hall, "because we know we can always depend on their performance. They are easy to handle, deliver big yardages day after day, and save us time and money."

Ability to haul large pay loads over soft fills and to dump loads clean and fast are two reasons why Bottom-Dump Euclids are so widely used on construction jobs. Your Euclid distributor or representative will be glad to discuss your requirements and supply helpful information.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

EUCLIDS *Move the Earth*

• Un
Falls,
millio
to ca
weste
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Vol.